

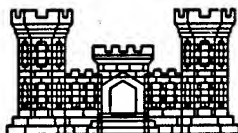
Limited Energy Study of Hangar Facilities at Simmons Army Airfield (SAAF), Fort Bragg, North Carolina

Final Report

Volume 2 of 2
Sections 6-10

CONTRACT #DACA01-94-D-0034
DELIVERY ORDER 0004
SYSTEMS CORP PROJECT #94013.04

April 26, 1995



Savannah District-
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of Engineers

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6 ECO - 1 CALCULATIONS

LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD, FT. BRAGG, NC

This section contains the life-cycle cost analyses, energy calculations, and cost estimates for ECO-1: Install High Efficiency Interior/Exterior Lighting Systems. For the buildings in this ECO, multiple options have been calculated when applicable. These options include:

1. Fluorescent fixture replacement
2. Incandescent lamp replacement
3. Exit sign replacement
4. Mercury vapor fixture replacement
5. Conventional sky light installation with automatic lighting control

DTIC QUALITY INSPECTED 2

A single life-cycle cost analysis and cost estimate was performed for each building which grouped all applicable options together.

The following pages contain the analysis for the Airfield buildings. These buildings contained a variety of fixtures. The following table details the replacement fixtures used.

TABLE 6.1 LIGHTING FIXTURE REPLACEMENTS AND INSTALLATIONS		
EXISTING FIXTURE	REPLACEMENT FIXTURE	NOTES
T-12 Fluorescent	T-8 Fluorescent with electronic ballast	A one-for-one lamp replacement with two-lamp fixtures. Three- and four- lamp fixtures were replaced by two- and three-lamp fixtures respectively, with reflectors added.
Incandescent	Compact Fluorescent	Incandescents larger than 200-watts in office areas were replaced with two- lamp, 4', T-8 fixtures.
Incandescent Exit Signs	LED Retrofit Kit	Existing fixture remains, incandescent lamps are removed and replaced by LED lamps.
Mercury Vapor	Metal Halide	One-for-one lamp replacement. 1,000- watt mercury vapors were replaced with 400-watt metal halides; 400-watt mercury vapors were replaced with 250- watt metal halides.
Exterior Lights	High Pressure Sodium (HPS)	Wattage of HPS based on equivalent lumen output of existing fixture.
—	Conventional Sky Lights	Evaluated for high bay hangar use every 600 sq. ft. Includes automatic lighting control.

6 ECO - 1 CALCULATIONS

LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD, FT. BRAGG, NC

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6 ECO - 1 CALCULATIONS

LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD, FT. BRAGG, NC

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BUILDING 2936

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LCCA

for Air Field Lighting Project

LIFE CYCLE COST ANALYSIS SUMMARY

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) STUDY: ECO1
 INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 LCCID - FY95 (92)
 PROJECT NO. & TITLE: ECO1 LIGHTING UPGRADE & SKY LIGHTS @ HANGARS CENSUS: 3
 FISCAL YEAR 95 DISCRETE PORTION NAME: LIGHTING
 ANALYSIS DATE: 02-03-95 ECONOMIC LIFE 10 YEARS PREPARED BY: JAH

1. INVESTMENT

A. CONSTRUCTION COST	\$	618894.	
B. SIOH	\$	30945.	
C. DESIGN COST	\$	30945.	
D. TOTAL COST (1A+1B+1C)	\$	680783.	
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.	
F. PUBLIC UTILITY COMPANY REBATE	\$	0.	
G. TOTAL INVESTMENT (1D - 1E - 1F)			\$ 680783.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1993

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	2140.	\$ 74780.	8.77	\$ 655823.
B. DIST	\$.00	0.	\$ 0.	9.26	\$ 0.
C. RESID	\$.00	0.	\$ 0.	10.08	\$ 0.
D. NAT G	\$.00	0.	\$ 0.	10.39	\$ 0.
E. COAL	\$.00	0.	\$ 0.	9.39	\$ 0.
F. LPG	\$.00	0.	\$ 0.	8.78	\$ 0.
M. DEMAND SAVINGS			\$ 70144.	8.49	\$ 595523.
N. TOTAL		2140.	\$ 144924.		\$ 1251345.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)	
(1) DISCOUNT FACTOR (TABLE A)	
(2) DISCOUNTED SAVING/COST (3A X 3A1)	8.49 \$ 22997.
	\$ 195245.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-)(4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-)(3A2+3Bd4)\$ 195245.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ 167921.

5. SIMPLE PAYBACK PERIOD (1G/4) 4.05 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 1446590.

7. SAVINGS TO INVESTMENT RATIO (SIR)=(6 / 1G)= 2.12
 (IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 11.17 %

ECO-1 CALCULATIONS

(sorted by building)

LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 2936H

LCCID FY95 (92)

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 2936H SKY LIGHTS & CONTROLS @ BLDG 2936

FISCAL YEAR 95 DISCRETE PORTION NAME: LIGHTING

ANALYSIS DATE: 02-03-95 ECONOMIC LIFE 10 YEARS PREPARED BY: JAH

1. INVESTMENT

A. CONSTRUCTION COST	\$	25134.		
B. SIOH	\$	1257.		
C. DESIGN COST	\$	1257.		
D. TOTAL COST (1A+1B+1C)	\$	27647.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.		
F. PUBLIC UTILITY COMPANY REBATE	\$	0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$		27647.	

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1993

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	75.	\$ 2612.	8.77	\$ 22911.
B. DIST	\$.00	0.	\$ 0.	9.26	\$ 0.
C. RESID	\$.00	0.	\$ 0.	10.08	\$ 0.
D. NAT G	\$.00	0.	\$ 0.	10.39	\$ 0.
E. COAL	\$.00	0.	\$ 0.	9.39	\$ 0.
F. LPG	\$.00	0.	\$ 0.	8.78	\$ 0.
M. DEMAND SAVINGS			\$ 2537.	8.49	\$ 21539.
N. TOTAL		75.	\$ 5149.		\$ 44450.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$ 477.
(1) DISCOUNT FACTOR (TABLE A)	8.49	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$ 4050.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-)(4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-)(3A2+3Bd4)\$ 4050.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS\ ECONOMIC\ LIFE))$ \$ 5626.

5. SIMPLE PAYBACK PERIOD (1G/4) 4.91 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 48499.

7. SAVINGS TO INVESTMENT RATIO (SIR)=(6 / 1G)= 1.75
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 9.06 %

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
02 FEBRUARY 1995

CONVENTIONAL SKY LIGHTS IN HANGARS

BUILDING #: 2936 - HANGAR

ELECTRIC COSTS:
ENERGY CHARGE \$0.03495 PER KWH
DEMAND CHARGE \$9.25 PER KW

WATTAGE CONTROLLED: 49,500 W
PEAK USE: 1 (1-YES, 0-NO)

CURRENT USAGE:
HOURS/YEAR 3,120

REVISED USAGE:
HOURS/YEAR 1,248

BASELINE ENERGY CONSUMPTION	154,440 KWH/YR	ECO ENERGY CONSUMPTION	61,776 KWH/YR
BASELINE DEMAND	49.5 KW	ECO DEMAND	0 KW

NET ENERGY SAVINGS	92,664 KWH/YR	NET DEMAND SAVINGS	\$5,495 /YR
		NET DOLLAR SAVINGS	\$8,733 /YR

MAINTENANCE SAVINGS

110 LAMPS @ \$47.00 / 20,000 HOURS *	3,120 HR/YR =	\$807 / YEAR	(WITHOUT SKYLIGHTS)
110 LAMPS @ \$47.00 / 20,000 HOURS *	1,248 HR/YR =	\$323 / YEAR	(WITH SKYLIGHTS)

NET MAINTENANCE SAVINGS \$484 /YEAR


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=====
Estimate:      BLDG 2936           Date:      FEBRUARY 2, 1995
Description:   CONVENTIONAL SKYLIGHT & CONTROLS
Project:      HANGAR STUDY       Bid Date: FEBRUARY 2, 1995
Location:     BLDG 2936         Job #:      94013.04
Sq. footage:   City indx:Raleigh, NC
=====

```

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0060000001	CONVENTIONAL SKYLIGHT WITH 4" INSULATED CURBS (DOUBLE PANED)					720.00	SQ. FT
Unit values		0.00	19.56	2.41	0.09	0.00	22.06
Totals		0.00	\$14,083	\$1,735	\$65	\$0	\$15,883
U00		0	\$14,083	\$1,735	\$65	\$0	\$15,883

=====						
Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1611350023	LOW VOLTAGE WIRE #18-4C					
Unit values	1.23	15.40	34.00	0.00	14.00 CLF	
Totals	17.22	\$216	\$476	\$0	0.00	49.40
					\$0	\$692
1611750101	LIGHTING CONTACTOR					
Unit values	2.00	137.00	55.00	0.00	6.00 EA.	
Totals	12.00	\$822	\$330	\$0	0.00	192.00
					\$0	\$1,152
1611850101	PHOTO SWITCH 50-500 FC ADJUSTABLE					
Unit values	1.00	290.00	27.50	0.00	4.00 EA.	
Totals	4.00	\$1,160	\$110	\$0	0.00	317.50
					\$0	\$1,270
1611870101	LOW VOLTAGE TRANS 115V-24V					
Unit values	0.67	64.00	18.35	0.00	1.00 EA.	
Totals	0.67	\$64	\$18	\$0	0.00	82.35
					\$0	\$82
1611870102	SWITCHING RELAYS					
Unit values	0.50	11.30	13.75	0.00	8.00 EA.	
Totals	4.00	\$90	\$110	\$0	0.00	25.05
					\$0	\$200
1611950101	1/2" EMT					
Unit values	0.05	0.38	1.29	0.00	500.00 LF	
Totals	25.00	\$190	\$645	\$0	0.00	1.67
					\$0	\$835
U16 ELECTRICAL	63	\$2,542	\$1,689	\$0	\$0	\$4,231

```
=====
Line #      Description
-----
      Manhours   Matl      Labor   Equipment   Sub      Total
=====
```

ESTIMATE TOTAL	63	\$16,625	\$3,424	\$65	\$0	\$20,114
SALES TAX	5.00%	\$831				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$17,456	\$3,424	\$65	\$0	\$20,945
CONTINGENCY	5.00%					\$1,047
BOND	5.00%					\$1,047
PROFIT	10.00%					\$2,095
JOB TOTAL						\$25,134

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=====
Estimate:      BLDG 2936           Date:      FEBRUARY 2, 1995
Description:   CONVENTIONAL SKYLIGHT & CONTROLS
Project:      HANGAR STUDY       Bid Date: FEBRUARY 2, 1995
Location:     BLDG 2936         Job #:    94013.04
Sq. footage:  City indx:Raleigh, NC
=====

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SUMMARY

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=====
Manhours  Matl  Labor  Equipment  Sub  Total
=====
U00              0  $14,083  $1,735      $65      $0  $15,883
U16 ELECTRICAL  63   $2,542  $1,689      $0      $0   $4,231
TOTAL          63  $16,625  $3,424      $65      $0  $20,114

SALES TAX      5.00%      $831
MATL MARKUP    0.00%        $0
LABOR MARKUP   0.00%          $0
EQUIPT MARKUP  0.00%          $0
SUB MARKUP     0.00%          $0

TOTAL BEFORE CONTINGENC  $17,456  $3,424  $65      $0  $20,945
CONTINGENCY      5.00%          $1,047
BOND              5.00%          $1,047
PROFIT           10.00%          $2,095

JOB TOTAL                                     $25,134

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LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 3007H

LCCID FY95 (92)

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 3007H SKY LIGHTS & CONTROLS @ BLDG 3007

FISCAL YEAR 95 DISCRETE PORTION NAME: LIGHTING

ANALYSIS DATE: 02-03-95 ECONOMIC LIFE 10 YEARS PREPARED BY: JAH

1. INVESTMENT

A. CONSTRUCTION COST	\$	26794.		
B. SIOH	\$	1340.		
C. DESIGN COST	\$	1340.		
D. TOTAL COST (1A+1B+1C)	\$	29473.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.		
F. PUBLIC UTILITY COMPANY REBATE	\$	0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$		29473.	

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1993

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	51.	\$ 1767.	8.77	\$ 15492.
B. DIST	\$.00	0.	\$ 0.	9.26	\$ 0.
C. RESID	\$.00	0.	\$ 0.	10.08	\$ 0.
D. NAT G	\$.00	0.	\$ 0.	10.39	\$ 0.
E. COAL	\$.00	0.	\$ 0.	9.39	\$ 0.
F. LPG	\$.00	0.	\$ 0.	8.78	\$ 0.
M. DEMAND SAVINGS			\$ 2997.	8.49	\$ 25445.
N. TOTAL		51.	\$ 4764.		\$ 40937.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$ 267.
(1) DISCOUNT FACTOR (TABLE A)	8.49	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$ 2267.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-)(4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-)(3A2+3Bd4)\$ 2267.

4. FIRST YEAR DOLLAR SAVINGS 2N3+3A+(3Bd1/(YRS ECONOMIC LIFE))\$ 5031.

5. SIMPLE PAYBACK PERIOD (1G/4) 5.86 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 43204.

7. SAVINGS TO INVESTMENT RATIO (SIR)=(6 / 1G)= 1.47
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 7.12 %

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
02 FEBRUARY 1995

CONVENTIONAL SKY LIGHTS IN HANGARS

BUILDING #: 3007 - HANGAR

ELECTRIC COSTS:
ENERGY CHARGE \$0.03495 PER KWH
DEMAND CHARGE \$9.25 PER KW

WATTAGE CONTROLLED: 27,000 W
PEAK USE: 1 (1-YES, 0-NO)

CURRENT USAGE:
HOURS/YEAR 3,120
REVISED USAGE:
HOURS/YEAR 1,248

BASELINE ENERGY CONSUMPTION	84,240	KWH/YR	ECO ENERGY CONSUMPTION	33,696	KWH/YR
BASELINE DEMAND	27	KW	ECO DEMAND	27	KW

NET ENERGY SAVINGS	50,544	KWH/YR	NET DEMAND SAVINGS	\$2,997	/YR
			NET DOLLAR SAVINGS	\$4,764	/YR

MAINTENANCE SAVINGS

90 LAMPS @ \$38.00 / 24,000 HOURS *	3,120	HR/YR =	\$445	/ YEAR	(WITHOUT SKYLIGHTS)
90 LAMPS @ \$38.00 / 24,000 HOURS *	1,248	HR/YR =	\$178	/ YEAR	(WITH SKYLIGHTS)

NET MAINTENANCE SAVINGS \$267 / YEAR

03-Feb-95

MeansData for Lotus

Page 1

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=====
Estimate:      BLDG 3007          Date:      FEBRUARY 2, 1995
Description:   CONVENTIONAL SKYLIGHT & CONTROLS
Project:      HANGAR STUDY      Bid Date: FEBRUARY 2, 1995
Location:     BLDG 3007        Job #:      94013.04
Sq. footage:   City indx:Raleigh, NC
=====

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Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0060000001	CONVENTIONAL SKYLIGHT WITH 4" INSULATED CURBS (DOUBLE PANED)					780.00 SQ. FT	
Unit values		0.00	19.56	2.41	0.09	0.00	22.06
Totals		0.00	\$15,257	\$1,880	\$70	\$0	\$17,207
U00		0	\$15,257	\$1,880	\$70	\$0	\$17,207

=====						
Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1611350023	LOW VOLTAGE WIRE #18-4C					
Unit values	1.23	15.40	34.00	0.00	14.00 CLF	0.00
Totals	17.22	\$216	\$476	\$0	\$0	49.40
1611750101	LIGHTING CONTACTOR					
Unit values	2.00	137.00	55.00	0.00	6.00 EA.	0.00
Totals	12.00	\$822	\$330	\$0	\$0	192.00
1611850101	PHOTO SWITCH 50-500 FC ADJUSTABLE					
Unit values	1.00	290.00	27.50	0.00	4.00 EA.	0.00
Totals	4.00	\$1,160	\$110	\$0	\$0	317.50
1611870101	LOW VOLTAGE TRANS 115V-24V					
Unit values	0.67	64.00	18.35	0.00	1.00 EA.	0.00
Totals	0.67	\$64	\$18	\$0	\$0	82.35
1611870102	SWITCHING RELAYS					
Unit values	0.50	11.30	13.75	0.00	8.00 EA.	0.00
Totals	4.00	\$90	\$110	\$0	\$0	25.05
1611950101	1/2" EMT					
Unit values	0.05	0.38	1.29	0.00	500.00 LF	0.00
Totals	25.00	\$190	\$645	\$0	\$0	1.67
U16 ELECTRICAL	63	\$2,542	\$1,689	\$0	\$0	\$835
						\$4,231


```
=====
Line #      Description
-----
      Manhours   Matl      Labor   Equipment   Sub      Total
=====
```

ESTIMATE TOTAL	63	\$17,799	\$3,569	\$70	\$0	\$21,438
SALES TAX	5.00%	\$890				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$18,689	\$3,569	\$70	\$0	\$22,328
CONTINGENCY	5.00%					\$1,116
BOND	5.00%					\$1,116
PROFIT	10.00%					\$2,233
JOB TOTAL						\$26,794

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=====
Estimate:      BLDG 3007          Date:      FEBRUARY 2, 1995
Description:   CONVENTIONAL SKYLIGHT & CONTROLS
Project:       HANGAR STUDY      Bid Date:  FEBRUARY 2, 1995
Location:     BLDG 3007         Job #:     94013.04
Sq. footage:   City indx:Raleigh, NC
=====

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SUMMARY

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=====
Manhours  Matl  Labor  Equipment  Sub  Total
=====
U00              0  $15,257  $1,880      $70      $0  $17,207
U16, ELECTRICAL  63  $2,542  $1,689      $0      $0  $4,231
TOTAL          63  $17,799  $3,569      $70      $0  $21,438

SALES TAX      5.00%      $890
MATL MARKUP    0.00%      $0
LABOR MARKUP   0.00%      $0
EQUIPT MARKUP  0.00%      $0
SUB MARKUP     0.00%      $0

TOTAL BEFORE CONTINGENC  $18,689  $3,569  $70      $0  $22,328
CONTINGENCY      5.00%      $1,116
BOND              5.00%      $1,116
PROFIT           10.00%      $2,233

JOB TOTAL                                $26,794
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LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 3262

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) LCCID FY95 (92)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 3262 SKY LIGHTS & LIGHTING PRODUCTS @ HANGARS

FISCAL YEAR 95 DISCRETE PORTION NAME: LIGHTING

ANALYSIS DATE: 02-03-95 ECONOMIC LIFE 10 YEARS PREPARED BY: JAH

1. INVESTMENT

A. CONSTRUCTION COST	\$	85498.		
B. SIOH	\$	4275.		
C. DESIGN COST	\$	4275.		
D. TOTAL COST (1A+1B+1C)	\$	94048.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.		
F. PUBLIC UTILITY COMPANY REBATE	\$	0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$		94048.	

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1993

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	420.	\$ 14681.	8.77	\$ 128753.
B. DIST	\$.00	0.	\$ 0.	9.26	\$ 0.
C. RESID	\$.00	0.	\$ 0.	10.08	\$ 0.
D. NAT G	\$.00	0.	\$ 0.	10.39	\$ 0.
E. COAL	\$.00	0.	\$ 0.	9.39	\$ 0.
F. LPG	\$.00	0.	\$ 0.	8.78	\$ 0.
M. DEMAND SAVINGS			\$ 9681.	8.49	\$ 82192.
N. TOTAL		420.	\$ 24362.		\$ 210945.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$ 1985.
(1) DISCOUNT FACTOR (TABLE A)	8.49	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$ 16853.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTOR (3)	DISCOUNTED SAVINGS(+)/ COST(-)(4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-)(3A2+3Bd4)\$ 16853.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS\ ECONOMIC\ LIFE))$ \$ 26347.

5. SIMPLE PAYBACK PERIOD (1G/4) 3.57 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 227797.

7. SAVINGS TO INVESTMENT RATIO (SIR)=(6 / 1G)= 2.42
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 12.64 %

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
16 DECEMBER 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 3262 - HANGAR

ELECTRIC COSTS:
ENERGY CHARGE \$0.03495 PER KWH
DEMAND CHARGE \$9.25 PER KW

AREA USE:
HOURS/DAY 18
DAYS/WEEK 7

EXISTING FIXTURE DATA

2 FOOT 2 LAMP U @ 92 W/FIXT = 0 WATTS

4 FOOT

111 2 LAMP @ 92 W/FIXT = 10,212 WATTS
2 3 LAMP @ 137 W/FIXT = 274 WATTS
34 4 LAMP @ 184 W/FIXT = 6,256 WATTS

8 FOOT

86 2 LAMP @ 144 W/FIXT = 12,384 WATTS

REPLACEMENT FIXTURE DATA

2 FOOT 0 2 LAMP U @ 58 W/FIXT = 0 WATTS

4 FOOT

113 2 LAMP @ 58 W/FIXT = 6,554 WATTS
34 3 LAMP @ 87 W/FIXT = 2,958 WATTS
4 LAMP @ 118 W/FIXT = 0 WATTS

8 FOOT

86 2 LAMP @ 125 W/FIXT = 10,750 WATTS

BASELINE ENERGY CONSUMPTION 190,834 KWH/YR ECO ENERGY CONSUMPTION 132,757 KWH/YR

BASELINE DEMAND 29.13 KW ECO DEMAND 20.26 KW

NET ENERGY SAVINGS

58,077 KWH/YR

NET DEMAND SAVINGS

\$984 /YR
\$3,014 /YR

MAINTENANCE SAVINGS

36 LAMPS @ \$5.00 / 20,000 HOURS * 6,570 HR/YR = \$59 / YEAR (4' FLUORESCENT LAMPS)

NET MAINTENANCE SAVINGS

\$59 /YEAR

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
16 DECEMBER 1994

INTERIOR LIGHTING: LIGHTING REPLACEMENT

BUILDING #: 3262	ELECTRIC COSTS:	
AREA USE: _____	ENERGY CHARGE	\$0.03495 PER KWH
HOURS/DAY: 18	DEMAND CHARGE	\$9.25 PER KW
DAYS/WEEK: 7		
PEAK USE: 1 (1-YES, 0-NO)		

EXISTING FIXTURE DATA

INCAND @ _____	WATTS = _____	0 WATTS
QUARTZ @ _____	WATTS = _____	0 WATTS
QUARTZ @ _____	WATTS = _____	0 WATTS
72 MV @ _____	1075 WATTS = _____	77,400 WATTS
MV @ _____	WATTS = _____	0 WATTS

REPLACEMENT FIXTURE DATA

0 MH @ _____	WATTS = _____	0 WATTS
0 MH @ _____	WATTS = _____	0 WATTS
0 MH @ _____	WATTS = _____	0 WATTS
72 MH @ _____	450 WATTS = _____	32,400 WATTS
0 HPS @ _____	WATTS = _____	0 WATTS

BASELINE ENERGY CONSUMPTION	507,125 KWH/YR	ECO ENERGY CONSUMPTION	212,285 KWH/YR
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BASELINE DEMAND	77.40 KW	ECO DEMAND	32.40 KW
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NET ENERGY SAVINGS	294,840 KWH/YR	NET DEMAND SAVINGS	\$4,995 /YR
		NET DOLLAR SAVINGS	\$15,300 /YR

MAINTENANCE SAVINGS

72 LAMPS @ \$70.00 / 24,000 HOURS *	6,570 HR/YR =	\$2,070 / YEAR	(MERCURY VAPOR)
72 LAMPS @ \$47.00 / 20,000 HOURS *	6,570 HR/YR =	\$1,112 / YEAR	(METAL HALIDE)

NET MAINTENANCE SAVINGS	\$958 /YEAR
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FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
16 DECEMBER 1994

INTERIOR LIGHTING: INCANDESCENT LAMP REPLACEMENT

BUILDING #: 3262 - HANGAR	ELECTRIC COSTS:	
AREA USE: _____	ENERGY CHARGE	\$0.03495 PER KWH
HOURS/DAY: 18	DEMAND CHARGE	\$9.25 PER KW
DAYS/WEEK: 7		
PEAK USE: 1 (1-YES, 0-NO)		

EXISTING INCANDESCENTS

LAMPS @ _____	52 W/FIXT = _____	0 WATTS
18 LAMPS @ _____	60 W/FIXT = _____	1,080 WATTS
LAMPS @ _____	75 W/FIXT = _____	0 WATTS
LAMPS @ _____	90 W/FIXT = _____	0 WATTS
LAMPS @ _____	100 W/FIXT = _____	0 WATTS

COMPACT FLUORESCENT REPLACEMENT

0 LAMPS @ _____	13 W/FIXT = _____	0 WATTS
18 LAMPS @ _____	13 W/FIXT = _____	234 WATTS
0 LAMPS @ _____	18 W/FIXT = _____	0 WATTS
0 LAMPS @ _____	26 W/FIXT = _____	0 WATTS
0 LAMPS @ _____	26 W/FIXT = _____	0 WATTS

BASELINE ENERGY CONSUMPTION	7,076 KWH/YR	ECO ENERGY CONSUMPTION	1,533 KWH/YR
BASELINE DEMAND	1.08 KW	ECO DEMAND	0.23 KW

NET ENERGY SAVINGS	5,543 KWH/YR	NET DEMAND SAVINGS	\$94 /YR
		NET DOLLAR SAVINGS	\$288 /YR

MAINTENANCE SAVINGS

18 LAMPS @ \$3.50 / 750 HOURS *	6,570 HR/YR =	\$552 / YEAR	(INCANDESCENT)
18 LAMPS @ \$2.00 / 10,000 HOURS *	6,570 HR/YR =	\$24 / YEAR	(COMPACT FLUORESCENT)
NET MAINTENANCE SAVINGS		\$528 /YEAR	

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
16 DECEMBER 1994

INTERIOR LIGHTING: EXIT SIGN REPLACEMENT

BUILDING #: 3262 - HANGAR

ELECTRIC COSTS:
ENERGY CHARGE \$0.03495 PER KWH
DEMAND CHARGE \$9.25 PER KW

INCANDESCENT EXIT SIGNS

OF EXIT SIGNS: 4
WATTAGE: 30

FLUORESCENT EXIT SIGNS

OF EXIT SIGNS: 0
WATTAGE: 18

REPLACEMENT SIGNS

OF EXIT SIGNS: 4
WATTAGE: 3

BASELINE ENERGY CONSUMPTION

1,051 KWH/YR ECO ENERGY CONSUMPTION 105 KWH/YR

BASELINE DEMAND

0.12 KW ECO DEMAND 0.01 KW

NET ENERGY SAVINGS

946 KWH/YR

NET DEMAND SAVINGS

\$12 /YR

NET DOLLAR SAVINGS

\$45 /YR

MAINTENANCE SAVINGS

4 LAMPS @ \$3.50 / 1,000 HOURS *
LAMPS @ / 10,000 HOURS *

8,760 HR/YR = \$123 / YEAR
HR/YR = \$0 / YEAR

(INCANDESCENT)
(COMPACT FLUORESCENT)

NET MAINTENANCE SAVINGS

\$123 /YEAR

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
02 FEBRUARY 1995

CONVENTIONAL SKY LIGHTS IN HANGARS

BUILDING #: 3262 - HANGAR

ELECTRIC COSTS:
ENERGY CHARGE \$0.03495 PER KWH
DEMAND CHARGE \$9.25 PER KW

WATTAGE CONTROLLED: 32,400 W (AFTER LIGHTING REPLACEMENT)
PEAK USE: 1 (1-YES, 0-NO)

CURRENT USAGE: HOURS/YEAR 3,120
REVISED USAGE: HOURS/YEAR 1,248

BASELINE ENERGY CONSUMPTION 101,088 KWH/YR ECO ENERGY CONSUMPTION 40,435 KWH/YR

BASELINE DEMAND 32.4 KW ECO DEMAND 32.4 KW

NET ENERGY SAVINGS 60,653 KWH/YR NET DEMAND SAVINGS \$3,596 /YR
NET DOLLAR SAVINGS \$5,716 /YR

MAINTENANCE SAVINGS

72 LAMPS @ \$47.00 / 20,000 HOURS * 3,120 HR/YR = \$528 / YEAR (WITHOUT SKYLIGHTS)
72 LAMPS @ \$47.00 / 20,000 HOURS * 1,248 HR/YR = \$211 / YEAR (WITH SKYLIGHTS)

NET MAINTENANCE SAVINGS \$317 / YEAR


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Estimate:    LIGHTING UPGRADE   Date:    FEBRUARY 2, 1995
Description: LIGHTING PRODUCT UPGRADE
Project:     HANGAR LIGHTING   Bid Date: FEBRUARY 2, 1995
Location:    BLDG 3262        Job #:    94013.04
Sq. footage:                      City indx:Raleigh, NC
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Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0002000000	DEMOLITION, 2X4 FLUORESCENT FIXTURES					40.00	FIXTURE
Unit values	0.49	0.00	13.35	0.00	0.00		13.35
Totals	19.60	\$0	\$534	\$0	\$0		\$534
0002010000	DEMOLITION, INCANDESCENT FIXTURES/EXIT SIGNS					22.00	FIXTURE
Unit values	0.26	0.00	7.10	0.00	0.00		7.10
Totals	5.72	\$0	\$156	\$0	\$0		\$156
0002020000	DEMOLITION, 1X4 FLUORESCENT FIXTURES					193.00	FIXTURE
Unit values	0.49	0.00	13.35	0.00	0.00		13.35
Totals	94.57	\$0	\$2,577	\$0	\$0		\$2,577
0002030000	DEMOLITION, HIGH BAY FIXTURES					72.00	FIXTURE
Unit values	1.00	0.00	27.50	0.00	0.00		27.50
Totals	72.00	\$0	\$1,980	\$0	\$0		\$1,980
0010100000	2X4 2-32 WATT FLUORESCENT LAMPS, RECESSED MOUNTED					4.00	FIXTURE
Unit values	1.51	59.00	41.50	0.00	0.00		100.50
Totals	6.04	\$236	\$166	\$0	\$0		\$402
0010200000	1X4 2-32 WATT FLUORESCENT LAMPS, RECESSED MOUNTED					101.00	FIXTURE
Unit values	1.14	51.00	31.50	0.00	0.00		82.50
Totals	115.14	\$5,151	\$3,182	\$0	\$0		\$8,333
0010300000	1X4 2-32 WATT FLUORESCENT LAMPS, WALL MOUNTED					6.00	FIXTURE
Unit values	1.14	60.00	31.50	0.00	0.00		91.50
Totals	6.84	\$360	\$189	\$0	\$0		\$549
0010500000	2X4 2-32 WATT FLUORESCENT LAMPS, RECESSED MOUNTED WITH REFLECTORS					2.00	FIXTURE
Unit values	1.51	75.00	41.50	0.00	0.00		116.50
Totals	3.02	\$150	\$83	\$0	\$0		\$233
0010600000	1X8 2-59 WATT FLUORESCENT LAMPS, PENDANT MOUNTED					86.00	FIXTURE

02-Feb-95

MeansData for Lotus

Page 2

Unit values	1.75	131.00	48.12	0.00	0.00	179.12
Totals	150.50	\$11,266	\$4,138	\$0	\$0	\$15,404
0010700000	LED EXIT SIGN, RETROFIT KIT					
					4.00	FIXTURE
Unit values	1.00	35.00	27.50	0.00	0.00	62.50
Totals	4.00	\$140	\$110	\$0	\$0	\$250
0011000000	400 WATT METAL HALIDE FIXTURE					
					72.00	FIXTURE
Unit values	2.00	207.00	55.00	0.00	0.00	262.00
Totals	144.00	\$14,904	\$3,960	\$0	\$0	\$18,864
0011100000	13 WATT COMPACT FLUORESCENT FIXTURE					
	GLOBE ASSEMBLY					
					18.00	FIXTURE
Unit values	0.13	25.50	3.44	0.00	0.00	28.94
Totals	2.34	\$459	\$62	\$0	\$0	\$521
0011400000	2X4 3-32 WATT FLUORESCENT LAMPS, SURFACE					
	MOUNTED WITH REFLECTOR					
					2.00	FIXTURE
Unit values	1.51	79.00	41.50	0.00	0.00	120.50
Totals	3.02	\$158	\$83	\$0	\$0	\$241

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
U00		627	\$32,824	\$17,220	\$0	\$0	\$50,044
ESTIMATE TOTAL		627	\$32,824	\$17,220	\$0	\$0	\$50,044
SALES TAX	5.00%		\$1,641				
MATL MARKUP	0.00%		\$0				
LABOR MARKUP	0.00%			\$0			
EQUIPT MARKUP	0.00%				\$0		
SUB MARKUP	0.00%					\$0	
TOTAL BEFORE CONTINGENC			\$34,465	\$17,220	\$0	\$0	\$51,685
CONTINGENCY	5.00%						\$2,584
BOND	5.00%						\$2,584
PROFIT	10.00%						\$5,169
JOB TOTAL							\$62,022

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Estimate:      LIGHTING UPGRADE   Date:      FEBRUARY 2, 1995
Description:   LIGHTING PRODUCT UPGRADE
Project:       HANGAR LIGHTING   Bid Date:  FEBRUARY 2, 1995
Location:      BLDG 3262         Job #:      94013.04
Sq. footage:   City indx:Raleigh, NC
=====

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SUMMARY

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=====
Manhours   Matl   Labor   Equipment   Sub   Total
=====
U00                627   $32,824   $17,220           $0       $0   $50,044
TOTAL                627   $32,824   $17,220           $0       $0   $50,044

SALES TAX          5.00%   $1,641
MATL MARKUP        0.00%       $0
LABOR MARKUP       0.00%           $0
EQUIPT MARKUP      0.00%           $0
SUB MARKUP         0.00%           $0

TOTAL BEFORE CONTINGENC   $34,465   $17,220           $0       $0   $51,685
CONTINGENCY             5.00%           $2,584
BOND                    5.00%           $2,584
PROFIT                  10.00%          $5,169

JOB TOTAL                                     $62,022
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Estimate:      BLDG 3262      Date:      FEBRUARY 2, 1995
Description:    CONVENTIONAL SKYLIGHT & CONTROLS
Project:       HANGAR STUDY   Bid Date: FEBRUARY 2, 1995
Location:      BLDG 3262     Job #:    94013.04
Sq. footage:   City indx:Raleigh, NC
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Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0060000001	CONVENTIONAL SKYLIGHT WITH 4" INSULATED CURBS (DOUBLE PANED)						
Unit values		0.00	19.56	2.41	0.09	0.00	22.06
Totals		0.00	\$12,910	\$1,591	\$59	\$0	\$14,560
U00		0	\$12,910	\$1,591	\$59	\$0	\$14,560

=====						
Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1611350023	LOW VOLTAGE WIRE #18-4C					
Unit values	1.23	15.40	34.00	0.00	14.00 CLF	49.40
Totals	17.22	\$216	\$476	\$0	\$0	\$692
1611750101	LIGHTING CONTACTOR					
Unit values	2.00	137.00	55.00	0.00	6.00 EA.	192.00
Totals	12.00	\$822	\$330	\$0	\$0	\$1,152
1611850101	PHOTO SWITCH 50-500 FC ADJUSTABLE					
Unit values	1.00	290.00	27.50	0.00	4.00 EA.	317.50
Totals	4.00	\$1,160	\$110	\$0	\$0	\$1,270
1611870101	LOW VOLTAGE TRANS 115V-24V					
Unit values	0.67	64.00	18.35	0.00	1.00 EA.	82.35
Totals	0.67	\$64	\$18	\$0	\$0	\$82
1611870102	SWITCHING RELAYS					
Unit values	0.50	11.30	13.75	0.00	8.00 EA.	25.05
Totals	4.00	\$90	\$110	\$0	\$0	\$200
1611950101	1/2" EMT					
Unit values	0.05	0.38	1.29	0.00	500.00 LF	1.67
Totals	25.00	\$190	\$645	\$0	\$0	\$835
U16 ELECTRICAL	63	\$2,542	\$1,689	\$0	\$0	\$4,231

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=====
Line #      Description
-----
      Manhours   Matl    Labor   Equipment   Sub    Total
=====
```

ESTIMATE TOTAL	63	\$15,452	\$3,280	\$59	\$0	\$18,791
SALES TAX	5.00%	\$773				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$16,225	\$3,280	\$59	\$0	\$19,564
CONTINGENCY	5.00%					\$978
BOND	5.00%					\$978
PROFIT	10.00%					\$1,956
JOB TOTAL						\$23,476

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Estimate:      BLDG 3262           Date:      FEBRUARY 2, 1995
Description:   CONVENTIONAL SKYLIGHT & CONTROLS
Project:      HANGAR STUDY       Bid Date:  FEBRUARY 2, 1995
Location:     BLDG 3262         Job #:      94013.04
Sq. footage:   City indx:Raleigh, NC
=====

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SUMMARY

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=====
Manhours  Matl  Labor  Equipment  Sub  Total
=====
U00              0  $12,910  $1,591      $59      $0  $14,560
U16 ELECTRICAL  63  $2,542  $1,689      $0      $0  $4,231
TOTAL          63  $15,452  $3,280      $59      $0  $18,791

SALES TAX      5.00%      $773
MATL MARKUP    0.00%      $0
LABOR MARKUP   0.00%      $0
EQUIPT MARKUP  0.00%      $0
SUB MARKUP     0.00%      $0

TOTAL BEFORE CONTINGENC  $16,225  $3,280  $59  $0  $19,564
CONTINGENCY      5.00%      $978
BOND              5.00%      $978
PROFIT           10.00%     $1,956

JOB TOTAL                                     $23,476

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LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 3354

LCCID FY95 (92)

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 3354 SKY LIGHTS & LIGHTING PRODUCTS @ HANGARS

FISCAL YEAR 95 DISCRETE PORTION NAME: LIGHTING

ANALYSIS DATE: 02-03-95 ECONOMIC LIFE 10 YEARS PREPARED BY: JAH

1. INVESTMENT

A. CONSTRUCTION COST	\$	38572.		
B. SIOH	\$	1929.		
C. DESIGN COST	\$	1929.		
D. TOTAL COST (1A+1B+1C)	\$	42429.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.		
F. PUBLIC UTILITY COMPANY REBATE	\$	0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$		42429.	

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1993

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	86.	\$ 2996.	8.77	\$ 26277.
B. DIST	\$.00	0.	\$ 0.	9.26	\$ 0.
C. RESID	\$.00	0.	\$ 0.	10.08	\$ 0.
D. NAT G	\$.00	0.	\$ 0.	10.39	\$ 0.
E. COAL	\$.00	0.	\$ 0.	9.39	\$ 0.
F. LPG	\$.00	0.	\$ 0.	8.78	\$ 0.
M. DEMAND SAVINGS			\$ 4198.	8.49	\$ 35641.
N. TOTAL		86.	\$ 7194.		\$ 61918.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$ 849.
(1) DISCOUNT FACTOR (TABLE A)	8.49	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$ 7208.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-)(4)
------	------------------------------	-----------------	------------------------	---

d. TOTAL	\$ 0.			0.
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C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-)(3A2+3Bd4)\$ 7208.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ 8043.

5. SIMPLE PAYBACK PERIOD (1G/4) 5.28 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 69126.

7. SAVINGS TO INVESTMENT RATIO (SIR)=(6 / 1G)= 1.63
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 8.26 %

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
16 DECEMBER 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 3354 - HANGAR

AREA USE: _____
HOURS/DAY: 10
DAYS/WEEK: 5

ELECTRIC COSTS:
ENERGY CHARGE \$0.03495 PER KWH
DEMAND CHARGE \$9.25 PER KW

EXISTING FIXTURE DATA

2 FOOT 2 LAMP U @ 92 W/FIXT = 0 WATTS

4 FOOT 131 2 LAMP @ 92 W/FIXT = 12,052 WATTS
3 LAMP @ 137 W/FIXT = 0 WATTS
4 LAMP @ 184 W/FIXT = 0 WATTS

8 FOOT 25 2 LAMP @ 144 W/FIXT = 3,600 WATTS

REPLACEMENT FIXTURE DATA

2 FOOT 0 2 LAMP U @ 58 W/FIXT = 0 WATTS

4 FOOT 131 2 LAMP @ 58 W/FIXT = 7,598 WATTS
0 3 LAMP @ 87 W/FIXT = 0 WATTS
0 4 LAMP @ 118 W/FIXT = 0 WATTS

8 FOOT 25 2 LAMP @ 125 W/FIXT = 3,125 WATTS

BASELINE ENERGY CONSUMPTION 40,695 KWH/YR ECO ENERGY CONSUMPTION 27,880 KWH/YR

BASELINE DEMAND 15.65 KW ECO DEMAND 10.72 KW

NET ENERGY SAVINGS 12,815 KWH/YR

NET DEMAND SAVINGS \$547 /YR
NET DOLLAR SAVINGS \$995 /YR

MAINTENANCE SAVINGS

0 LAMPS @ \$5.00 / 20,000 HOURS * HR/YR = \$0 / YEAR (4' FLUORESCENT LAMPS)

NET MAINTENANCE SAVINGS \$0 /YEAR

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
16 DECEMBER 1994

INTERIOR LIGHTING: LIGHTING REPLACEMENT

BUILDING #: 3354 - HANGAR
AREA USE: _____
HOURS/DAY: 10
DAYS/WEEK: 5
PEAK USE: 1 (1-YES, 0-NO)

ELECTRIC COSTS:
ENERGY CHARGE \$0.03495 PER KWH
DEMAND CHARGE \$9.25 PER KW

EXISTING FIXTURE DATA

28 INCAND @ 75 WATTS = 2,100 WATTS
QUARTZ @ _____ WATTS = _____ WATTS
QUARTZ @ _____ WATTS = _____ WATTS
MV @ _____ WATTS = _____ WATTS
MV @ _____ WATTS = _____ WATTS

REPLACEMENT FIXTURE DATA

14 2 LAMP @ 58 W/FIXT = 812 WATTS
(FOUR FOOT FLUORESCENT FIXTURES)
0 MH @ _____ WATTS = _____ WATTS
0 MH @ 450 WATTS = _____ WATTS
0 HPS @ _____ WATTS = _____ WATTS

BASELINE ENERGY CONSUMPTION 5,460 KWH/YR

ECO ENERGY CONSUMPTION 2,111 KWH/YR

BASELINE DEMAND 2.10 KW

ECO DEMAND 0.81 KW

NET ENERGY SAVINGS 3,349 KWH/YR

NET DEMAND SAVINGS

\$143 /YR

NET DOLLAR SAVINGS

\$260 /YR

MAINTENANCE SAVINGS

28 LAMPS @ \$3.50 /750 HOURS * 2,600 HR/YR = \$340 / YEAR (INCANDESCENT)
28 LAMPS @ \$5.00 / 20,000 HOURS * 2,600 HR/YR = \$18 / YEAR (FLUORESCENT)

NET MAINTENANCE SAVINGS \$322 /YEAR

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
16 DECEMBER 1994

INTERIOR LIGHTING: INCANDESCENT LAMP REPLACEMENT

BUILDING #: 3354 - HANGAR

AREA USE:

HOURS/DAY 10

DAYS/WEEK 5

PEAK USE 1 (1-YES, 0-NO)

ELECTRIC COSTS:
ENERGY CHARGE \$0.03495 PER KWH
DEMAND CHARGE \$9.25 PER KW

EXISTING INCANDESCENTS

LAMPS @ 52 W/FIXT = 0 WATTS
LAMPS @ 60 W/FIXT = 0 WATTS
15 LAMPS @ 75 W/FIXT = 1,125 WATTS
LAMPS @ 90 W/FIXT = 0 WATTS
LAMPS @ 100 W/FIXT = 0 WATTS

COMPACT FLUORESCENT REPLACEMENT

0 LAMPS @ 13 W/FIXT = 0 WATTS
0 LAMPS @ 13 W/FIXT = 0 WATTS
15 LAMPS @ 18 W/FIXT = 270 WATTS
0 LAMPS @ 26 W/FIXT = 0 WATTS
0 LAMPS @ 26 W/FIXT = 0 WATTS

BASELINE ENERGY CONSUMPTION 2,925 KWH/YR

ECO ENERGY CONSUMPTION

702 KWH/YR

BASELINE DEMAND

1.13 KW

ECO DEMAND

0.27 KW

NET ENERGY SAVINGS

2,223 KWH/YR

NET DEMAND SAVINGS

\$95 /YR
\$173 /YR

MAINTENANCE SAVINGS

15 LAMPS @ \$3.50 / 750 HOURS *
15 LAMPS @ \$2.00 / 10,000 HOURS *

2,600 HR/YR = \$182 / YEAR
2,600 HR/YR = \$8 / YEAR

(INCANDESCENT)
(COMPACT FLUORESCENT)

NET MAINTENANCE SAVINGS

\$174 /YEAR

FORT BRAGG LIMITED ENERGY STUDY

OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
02 FEBRUARY 1995

CONVENTIONAL SKY LIGHTS IN HANGARS

BUILDING #: 3354 - HANGAR

ELECTRIC COSTS:
ENERGY CHARGE \$0.03495 PER KWH
DEMAND CHARGE \$9.25 PER KW

WATTAGE CONTROLLED: 30,750 W
PEAK USE: 1 (1-YES, 0-NO)

CURRENT USAGE:
HOURS/YEAR 3,650

REVISED USAGE:
HOURS/YEAR 1,460

BASELINE ENERGY CONSUMPTION 112,238 KWH/YR ECO ENERGY CONSUMPTION 44,895 KWH/YR

BASELINE DEMAND 30.75 KW ECO DEMAND 30.75 KW

NET ENERGY SAVINGS 67,343 KWH/YR NET DEMAND SAVINGS \$3,413 /YR
NET DOLLAR SAVINGS \$5,767 /YR

MAINTENANCE SAVINGS

41 LAMPS @ \$38.00	/ 24,000 HOURS *	3,650 HR/YR =	\$237 / YEAR	(WITHOUT SKYLIGHTS)
41 LAMPS @ \$47.00	/ 20,000 HOURS *	3,650 HR/YR =	\$352 / YEAR	(WITHOUT SKYLIGHTS)
41 LAMPS @ \$38.00	/ 24,000 HOURS *	1,460 HR/YR =	\$95 / YEAR	(WITH SKYLIGHTS)
41 LAMPS @ \$47.00	/ 20,000 HOURS *	1,460 HR/YR =	\$141 / YEAR	(WITH SKYLIGHTS)

NET MAINTENANCE SAVINGS \$353 /YEAR

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=====
Estimate:      LIGHTING UPGRADE   Date:      FEBRUARY 2, 1995
Description:   LIGHTING PRODUCT UPGRADE
Project:      HANGAR LIGHTING   Bid Date: FEBRUARY 2, 1995
Location:     BLDG 3354        Job #:      94013.04
Sq. footage:                      City indx:Raleigh, NC
=====

```

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0002010000	DEMOLITION, INCANDESCENT FIXTURES/EXIT SIGNS					43.00	FIXTURE
Unit values	0.26	0.00	7.10	0.00	0.00		7.10
Totals	11.18	\$0	\$305	\$0	\$0		\$305
0002020000	DEMOLITION, 1X4 FLUORESCENT FIXTURES					170.00	FIXTURE
Unit values	0.49	0.00	13.35	0.00	0.00		13.35
Totals	83.30	\$0	\$2,270	\$0	\$0		\$2,270
0010000000	1X4 2-32 WATT FLUORESCENT LAMPS, SURFACE MOUNTED					14.00	FIXTURE
Unit values	1.14	60.00	31.50	0.00	0.00		91.50
Totals	15.96	\$840	\$441	\$0	\$0		\$1,281
0010400000	1X4 2-32 WATT FLUORESCENT LAMPS, PENDANT MOUNTED					131.00	FIXTURE
Unit values	1.14	39.00	31.50	0.00	0.00		70.50
Totals	149.34	\$5,109	\$4,127	\$0	\$0		\$9,236
0010600000	1X8 2-59 WATT FLUORESCENT LAMPS, PENDANT MOUNTED					25.00	FIXTURE
Unit values	1.75	131.00	48.12	0.00	0.00		179.12
Totals	43.75	\$3,275	\$1,203	\$0	\$0		\$4,478
0011200000	18 WATT COMPACT FLUORESCENT FIXTURE GLOBE ASSEMBLY					15.00	FIXTURE
Unit values	0.13	25.50	3.44	0.00	0.00		28.94
Totals	1.95	\$383	\$52	\$0	\$0		\$435
U00		306	\$9,607	\$8,398	\$0	\$0	\$18,005

```
=====
Line #      Description
-----
      Manhours  Matl    Labor  Equipment  Sub    Total
=====
```

ESTIMATE TOTAL	306	\$9,607	\$8,398	\$0	\$0	\$18,005
SALES TAX	5.00%	\$480				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$10,087	\$8,398	\$0	\$0	\$18,485
CONTINGENCY	5.00%					\$924
BOND	5.00%					\$924
PROFIT	10.00%					\$1,849
JOB TOTAL						\$22,182

```

=====
Estimate:      LIGHTING UPGRADE   Date:      FEBRUARY 2, 1995
Description:   LIGHTING PRODUCT UPGRADE
Project:       HANGAR LIGHTING   Bid Date:  FEBRUARY 2, 1995
Location:      BLDG 3354         Job #:     94013.04
Sq. footage:   City indx:Raleigh, NC
=====

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SUMMARY

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=====
              Manhours   Matl      Labor   Equipment   Sub      Total
=====
U00              306      $9,607    $8,398         $0         $0    $18,005
TOTAL            306      $9,607    $8,398         $0         $0    $18,005

SALES TAX        5.00%      $480
MATL MARKUP      0.00%        $0
LABOR MARKUP     0.00%          $0
EQUIPT MARKUP    0.00%          $0
SUB MARKUP       0.00%          $0

TOTAL BEFORE CONTINGENC $10,087    $8,398         $0         $0    $18,485
CONTINGENCY       5.00%          $924
BOND              5.00%          $924
PROFIT           10.00%         $1,849

JOB TOTAL                                $22,182
=====

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=====
Estimate:      BLDG 3354          Date:      FEBRUARY 2, 1995
Description:   CONVENTIONAL SKYLIGHT & CONTROLS
Project:      HANGAR STUDY      Bid Date: FEBRUARY 2, 1995
Location:     BLDG 3354        Job #:      94013.04
Sq. footage:   City indx:Raleigh, NC
=====

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Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0060000001	CONVENTIONAL SKYLIGHT WITH 4" INSULATED CURBS (DOUBLE PANED)					450.00 SQ. FT	
Unit values		0.00	19.56	2.41	0.09	0.00	22.06
Totals		0.00	\$8,802	\$1,085	\$41	\$0	\$9,928
U00		0	\$8,802	\$1,085	\$41	\$0	\$9,928

=====						
Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1611350023	LOW VOLTAGE WIRE #18-4C					
Unit values	1.23	15.40	34.00	0.00	10.00 CLF	
Totals	12.30	\$154	\$340	\$0	0.00	49.40
					\$0	\$494
1611750101	LIGHTING CONTACTOR					
Unit values	2.00	137.00	55.00	0.00	3.00 EA.	
Totals	6.00	\$411	\$165	\$0	0.00	192.00
					\$0	\$576
1611850101	PHOTO SWITCH 50-500 FC ADJUSTABLE					
Unit values	1.00	290.00	27.50	0.00	4.00 EA.	
Totals	4.00	\$1,160	\$110	\$0	0.00	317.50
					\$0	\$1,270
1611870101	LOW VOLTAGE TRANS 115V-24V					
Unit values	0.67	64.00	18.35	0.00	1.00 EA.	
Totals	0.67	\$64	\$18	\$0	0.00	82.35
					\$0	\$82
1611870102	SWITCHING RELAYS					
Unit values	0.50	11.30	13.75	0.00	8.00 EA.	
Totals	4.00	\$90	\$110	\$0	0.00	25.05
					\$0	\$200
1611950101	1/2" EMT					
Unit values	0.05	0.38	1.29	0.00	340.00 LF	
Totals	17.00	\$129	\$439	\$0	0.00	1.67
					\$0	\$568
U16 ELECTRICAL	44	\$2,008	\$1,182	\$0	\$0	\$3,190

```
=====
Line #      Description
-----
      Manhours  Matl    Labor   Equipment   Sub    Total
=====
```

ESTIMATE TOTAL	44	\$10,810	\$2,267	\$41	\$0	\$13,118
SALES TAX	5.00%	\$541				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$11,351	\$2,267	\$41	\$0	\$13,659
CONTINGENCY	5.00%					\$683
BOND	5.00%					\$683
PROFIT	10.00%					\$1,366
JOB TOTAL						\$16,390

```

=====
Estimate:      BLDG 3354      Date:      FEBRUARY 2, 1995
Description:   CONVENTIONAL SKYLIGHT & CONTROLS
Project:       HANGAR STUDY   Bid Date:  FEBRUARY 2, 1995
Location:     BLDG 3354      Job #:     94013.04
Sq. footage:   City indx:Raleigh, NC
=====

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SUMMARY

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=====
Manhours  Matl  Labor  Equipment  Sub  Total
=====
U00              0    $8,802    $1,085        $41        $0    $9,928
U16 ELECTRICAL  44    $2,008    $1,182         $0        $0    $3,190
TOTAL          44   $10,810    $2,267        $41        $0   $13,118

SALES TAX      5.00%    $541
MATL MARKUP    0.00%      $0
LABOR MARKUP   0.00%          $0
EQUIPT MARKUP  0.00%          $0
SUB MARKUP     0.00%          $0

TOTAL BEFORE CONTINGENC  $11,351    $2,267        $41        $0   $13,659
CONTINGENCY      5.00%          $683
BOND             5.00%          $683
PROFIT          10.00%         $1,366

JOB TOTAL                                     $16,390

```

LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 3637
LCCID FY95 (92)

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 3637 SKY LIGHTS & LIGHTING PRODUCTS @ HANGARS

FISCAL YEAR 95 DISCRETE PORTION NAME: LIGHTING

ANALYSIS DATE: 02-03-95 ECONOMIC LIFE 10 YEARS PREPARED BY: JAH

1. INVESTMENT

A. CONSTRUCTION COST	\$	37974.		
B. SIOH	\$	1899.		
C. DESIGN COST	\$	1899.		
D. TOTAL COST (1A+1B+1C)	\$	41771.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.		
F. PUBLIC UTILITY COMPANY REBATE	\$	0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$			41771.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1993

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	278.	\$ 9701.	8.77	\$ 85074.
B. DIST	\$.00	0.	\$ 0.	9.26	\$ 0.
C. RESID	\$.00	0.	\$ 0.	10.08	\$ 0.
D. NAT G	\$.00	0.	\$ 0.	10.39	\$ 0.
E. COAL	\$.00	0.	\$ 0.	9.39	\$ 0.
F. LPG	\$.00	0.	\$ 0.	8.78	\$ 0.
M. DEMAND SAVINGS			\$ 6075.	8.49	\$ 51577.
N. TOTAL		278.	\$ 15776.		\$ 136651.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$ 769.
(1) DISCOUNT FACTOR (TABLE A)	8.49	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$ 6529.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-)(4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-)(3A2+3Bd4)\$ 6529.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS\ ECONOMIC\ LIFE))$ \$ 16545.

5. SIMPLE PAYBACK PERIOD (1G/4) 2.52 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 143179.

7. SAVINGS TO INVESTMENT RATIO (SIR)=(6 / 1G)= 3.43
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 16.62 %

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
16 DECEMBER 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 3637 - HANGAR

AREA USE: _____
HOURS/DAY: 18
DAYS/WEEK: 7

ELECTRIC COSTS:
ENERGY CHARGE \$0.03495 PER KWH
DEMAND CHARGE \$9.25 PER KW

EXISTING FIXTURE DATA

2 FOOT 2 LAMP U @ 92 W/FIXT = 0 WATTS

4 FOOT

92 2 LAMP @ 92 W/FIXT = 8,464 WATTS
3 LAMP @ 137 W/FIXT = 0 WATTS
4 LAMP @ 184 W/FIXT = 0 WATTS

8 FOOT 2 LAMP @ 144 W/FIXT = 0 WATTS

REPLACEMENT FIXTURE DATA

2 FOOT 0 2 LAMP U @ 58 W/FIXT = 0 WATTS

4 FOOT

92 2 LAMP @ 58 W/FIXT = 5,336 WATTS
0 3 LAMP @ 87 W/FIXT = 0 WATTS
0 4 LAMP @ 118 W/FIXT = 0 WATTS

8 FOOT 0 2 LAMP @ 125 W/FIXT = 0 WATTS

BASELINE ENERGY CONSUMPTION 55,456 KWH/YR ECO ENERGY CONSUMPTION 34,961 KWH/YR

BASELINE DEMAND 8.46 KW ECO DEMAND 5.34 KW

NET ENERGY SAVINGS 20,495 KWH/YR

NET DEMAND SAVINGS \$347 /YR
NET DOLLAR SAVINGS \$1,063 /YR

MAINTENANCE SAVINGS

LAMPS @ \$5.00 / 20,000 HOURS * HRYR = \$0 / YEAR (4' FLUORESCENT LAMPS)

NET MAINTENANCE SAVINGS \$0 /YEAR

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
16 DECEMBER 1994

INTERIOR LIGHTING: LIGHTING REPLACEMENT

BUILDING #: 3637 - HANGAR	ELECTRIC COSTS:	
AREA USE: _____	ENERGY CHARGE	\$0.03495 PER KWH
HOURS/DAY: 18	DEMAND CHARGE	\$9.25 PER KW
DAYS/WEEK: 7		
PEAK USE: 1 (1-YES, 0-NO)		

EXISTING FIXTURE DATA

INCAND @ _____	WATTS = _____	0 WATTS
QUARTZ @ _____	WATTS = _____	0 WATTS
QUARTZ @ _____	WATTS = _____	0 WATTS
48 MV @ _____	1075 WATTS = _____	51,600 WATTS
MV @ _____	WATTS = _____	0 WATTS

REPLACEMENT FIXTURE DATA

0 MH @ _____	WATTS = _____	0 WATTS
0 MH @ _____	WATTS = _____	0 WATTS
0 MH @ _____	WATTS = _____	0 WATTS
48 MH @ _____	450 WATTS = _____	21,600 WATTS
0 HPS @ _____	WATTS = _____	0 WATTS

BASELINE ENERGY CONSUMPTION	338,083 KWH/YR	ECO ENERGY CONSUMPTION	141,523 KWH/YR
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BASELINE DEMAND	51.60 KW	ECO DEMAND	21.60 KW
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NET ENERGY SAVINGS	196,560 KWH/YR	NET DEMAND SAVINGS	\$3,330 /YR
		NET DOLLAR SAVINGS	\$10,200 /YR

MAINTENANCE SAVINGS

48 LAMPS @ \$70.00 / 24,000 HOURS *	6,570 HR/YR =	\$920 / YEAR	(MERCURY VAPOR)
48 LAMPS @ \$47.00 / 20,000 HOURS *	6,570 HR/YR =	\$741 / YEAR	(METAL HALIDE)

NET MAINTENANCE SAVINGS	\$179 /YEAR
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FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
16 DECEMBER 1994

INTERIOR LIGHTING: INCANDESCENT LAMP REPLACEMENT

BUILDING #: 3637 - HANGAR

AREA USE:

HOURS/DAY 18

DAYS/WEEK 7

PEAK USE 1 (1-YES, 0-NO)

ELECTRIC COSTS:
ENERGY CHARGE \$0.03495 PER KWH
DEMAND CHARGE \$9.25 PER KW

EXISTING INCANDESCENTS

LAMPS @	52	W/FIXT =	0	WATTS
LAMPS @	60	W/FIXT =	0	WATTS
10 LAMPS @	75	W/FIXT =	750	WATTS
LAMPS @	90	W/FIXT =	0	WATTS
LAMPS @	100	W/FIXT =	0	WATTS

COMPACT FLUORESCENT REPLACEMENT

0 LAMPS @	13	W/FIXT =	0	WATTS
0 LAMPS @	13	W/FIXT =	0	WATTS
10 LAMPS @	18	W/FIXT =	180	WATTS
0 LAMPS @	26	W/FIXT =	0	WATTS
0 LAMPS @	26	W/FIXT =	0	WATTS

BASELINE ENERGY CONSUMPTION 4,914 KWH/YR

ECO ENERGY CONSUMPTION 1,179 KWH/YR

BASELINE DEMAND

0.75 KW

ECO DEMAND

0.18 KW

NET ENERGY SAVINGS

3,735 KWH/YR

NET DEMAND SAVINGS

\$0 /YR

NET DOLLAR SAVINGS

\$63 /YR

MAINTENANCE SAVINGS

10 LAMPS @ \$3.50 / 750 HOURS *
10 LAMPS @ \$2.00 / 10,000 HOURS *

6,570 HR/YR = \$307 / YEAR
6,570 HR/YR = \$13 / YEAR

(INCANDESCENT)
(COMPACT FLUORESCENT)

NET MAINTENANCE SAVINGS

\$294 /YEAR

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
02 FEBRUARY 1995

CONVENTIONAL SKY LIGHTS IN HANGARS

BUILDING #: 3637 - HANGAR

ELECTRIC COSTS:
ENERGY CHARGE \$0.03495 PER KWH
DEMAND CHARGE \$9.25 PER KW

WATTAGE CONTROLLED: 21,600 W
PEAK USE: 1 (1-YES, 0-NO)

CURRENT USAGE:
HOURS/YEAR 6,570

REVISED USAGE:
HOURS/YEAR 3,942

BASELINE ENERGY CONSUMPTION	141,912 KWH/YR	ECO ENERGY CONSUMPTION	85,147 KWH/YR
BASELINE DEMAND	21.6 KW	ECO DEMAND	21.6 KW

NET ENERGY SAVINGS	56,765 KWH/YR	NET DEMAND SAVINGS	\$2,398 /YR
		NET DOLLAR SAVINGS	\$4,382 /YR

MAINTENANCE SAVINGS

48 LAMPS @ \$47.00 / 20,000 HOURS *	6,570	HR/YR =	\$741 / YEAR	(WITHOUT SKYLIGHTS)
48 LAMPS @ \$47.00 / 20,000 HOURS *	3,942	HR/YR =	\$445 / YEAR	(WITH SKYLIGHTS)

NET MAINTENANCE SAVINGS \$296 /YEAR

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=====
Estimate:      LIGHTING UPGRADE   Date:      FEBRUARY 2, 1995
Description:    LIGHTING PRODUCT UPGRADE
Project:        HANGAR LIGHTING   Bid Date:  FEBRUARY 2, 1995
Location:       BLDG 3637         Job #:    94013.04
Sq. footage:    City indx:Raleigh, NC
=====

```

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0002010000	DEMOLITION, INCANDESCENT FIXTURES/EXIT SIGNS						
						10.00	FIXTURE
Unit values	0.26	0.00	7.10	0.00		0.00	7.10
Totals	2.60	\$0	\$71	\$0		\$0	\$71
0002020000	DEMOLITION, 1X4 FLUORESCENT FIXTURES						
						92.00	FIXTURE
Unit values	0.49	0.00	13.35	0.00		0.00	13.35
Totals	45.08	\$0	\$1,228	\$0		\$0	\$1,228
0002030000	DEMOLITION, HIGH BAY FIXTURES						
						48.00	FIXTURE
Unit values	1.00	0.00	27.50	0.00		0.00	27.50
Totals	48.00	\$0	\$1,320	\$0		\$0	\$1,320
0010400000	1X4 2-32 WATT FLUORESCENT LAMPS, PENDANT MOUNTED						
						92.00	FIXTURE
Unit values	1.14	39.00	31.50	0.00		0.00	70.50
Totals	104.88	\$3,588	\$2,898	\$0		\$0	\$6,486
0011000000	400 WATT METAL HALIDE FIXTURE						
						48.00	FIXTURE
Unit values	2.00	207.00	55.00	0.00		0.00	262.00
Totals	96.00	\$9,936	\$2,640	\$0		\$0	\$12,576
0011200000	18 WATT COMPACT FLUORESCENT FIXTURE GLOBE ASSEMBLY						
						10.00	FIXTURE
Unit values	0.13	25.50	3.44	0.00		0.00	28.94
Totals	1.30	\$255	\$34	\$0		\$0	\$289
U00		298	\$13,779	\$8,191	\$0	\$0	\$21,970

```
=====
Line #      Description
-----
      Manhours  Matl    Labor  Equipment  Sub    Total
=====
```

ESTIMATE TOTAL	298	\$13,779	\$8,191	\$0	\$0	\$21,970
SALES TAX	5.00%	\$689				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$14,468	\$8,191	\$0	\$0	\$22,659
CONTINGENCY	5.00%					\$1,133
BOND	5.00%					\$1,133
PROFIT	10.00%					\$2,266
JOB TOTAL						\$27,191

```

=====
Estimate:      LIGHTING UPGRADE   Date:      FEBRUARY 2, 1995
Description:   LIGHTING PRODUCT UPGRADE
Project:      HANGAR LIGHTING    Bid Date:  FEBRUARY 2, 1995
Location:     BLDG 3637          Job #:      94013.04
Sq. footage:   City indx:Raleigh, NC
=====

```

SUMMARY

```

=====
              Manhours   Matl      Labor    Equipment   Sub      Total
=====
U00              298     $13,779    $8,191         $0         $0    $21,970
TOTAL            298     $13,779    $8,191         $0         $0    $21,970

SALES TAX        5.00%         $689
MATL MARKUP      0.00%         $0
LABOR MARKUP     0.00%         $0
EQUIPT MARKUP    0.00%         $0
SUB MARKUP       0.00%         $0

TOTAL BEFORE CONTINGENC $14,468    $8,191         $0         $0    $22,659
CONTINGENCY       5.00%                $1,133
BOND              5.00%                $1,133
PROFIT           10.00%                $2,266

JOB TOTAL                                $27,191

```

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=====
Estimate:      BLDG 3637      Date:      FEBRUARY 2, 1995
Description:   CONVENTIONAL SKYLIGHT & CONTROLS
Project:      HANGAR STUDY   Bid Date: FEBRUARY 2, 1995
Location:     BLDG 3637     Job #:    94013.04
Sq. footage:   City indx:Raleigh, NC
=====

```

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0060000001	CONVENTIONAL SKYLIGHT WITH 4" INSULATED CURBS (DOUBLE PANED)						
Unit values		0.00	19.56	2.41	0.09	300.00	SQ. FT
Totals		0.00	\$5,868	\$723	\$27	0.00	22.06
						\$0	\$6,618
U00		0	\$5,868	\$723	\$27	\$0	\$6,618

=====						
Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1611350023	LOW VOLTAGE WIRE #18-4C					
Unit values	1.23	15.40	34.00	0.00	5.00 CLF	
Totals	6.15	\$77	\$170	\$0	0.00	49.40
					\$0	\$247
1611750101	LIGHTING CONTACTOR					
Unit values	2.00	137.00	55.00	0.00	2.00 EA.	
Totals	4.00	\$274	\$110	\$0	0.00	192.00
					\$0	\$384
1611850101	PHOTO SWITCH 50-500 FC ADJUSTABLE					
Unit values	1.00	290.00	27.50	0.00	2.00 EA.	
Totals	2.00	\$580	\$55	\$0	0.00	317.50
					\$0	\$635
1611870101	LOW VOLTAGE TRANS 115V-24V					
Unit values	0.67	64.00	18.35	0.00	1.00 EA.	
Totals	0.67	\$64	\$18	\$0	0.00	82.35
					\$0	\$82
1611870102	SWITCHING RELAYS					
Unit values	0.50	11.30	13.75	0.00	4.00 EA.	
Totals	2.00	\$45	\$55	\$0	0.00	25.05
					\$0	\$100
1611950101	1/2" EMT					
Unit values	0.05	0.38	1.29	0.00	340.00 LF	
Totals	17.00	\$129	\$439	\$0	0.00	1.67
					\$0	\$568
U16 ELECTRICAL	32	\$1,169	\$847	\$0	\$0	\$2,016

```
=====
Line #      Description
-----
      Manhours  Matl    Labor  Equipment  Sub    Total
=====
```

ESTIMATE TOTAL	32	\$7,037	\$1,570	\$27	\$0	\$8,634
SALES TAX	5.00%	\$352				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$7,389	\$1,570	\$27	\$0	\$8,986
CONTINGENCY	5.00%					\$449
BOND	5.00%					\$449
PROFIT	10.00%					\$899
JOB TOTAL						\$10,783

```

=====
Estimate:      BLDG 3637          Date:      FEBRUARY 2, 1995
Description:   CONVENTIONAL SKYLIGHT & CONTROLS
Project:       HANGAR STUDY      Bid Date:  FEBRUARY 2, 1995
Location:      BLDG 3637        Job #:      94013.04
Sq. footage:   City indx:Raleigh, NC
=====

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SUMMARY

```

=====
Manhours  Matl  Labor  Equipment  Sub  Total
=====
U00              0  $5,868    $723      $27      $0  $6,618
U16 ELECTRICAL  32  $1,169    $847      $0      $0  $2,016
TOTAL          32  $7,037    $1,570    $27      $0  $8,634

SALES TAX        5.00%    $352
MATL MARKUP      0.00%      $0
LABOR MARKUP     0.00%      $0
EQUIPT MARKUP    0.00%      $0
SUB MARKUP       0.00%      $0

TOTAL BEFORE CONTINGENC  $7,389  $1,570  $27  $0  $8,986
CONTINGENCY          5.00%      $449
BOND                 5.00%      $449
PROFIT              10.00%     $899

JOB TOTAL                                     $10,783

```


LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 3642

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) LCCID FY95 (92)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 3642 SKY LIGHTS & LIGHTING PRODUCTS @ HANGARS

FISCAL YEAR 95 DISCRETE PORTION NAME: LIGHTING

ANALYSIS DATE: 02-03-95 ECONOMIC LIFE 10 YEARS PREPARED BY: JAH

1. INVESTMENT

A. CONSTRUCTION COST	\$	60635.		
B. SIOH	\$	3032.		
C. DESIGN COST	\$	3032.		
D. TOTAL COST (1A+1B+1C)	\$	66699.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.		
F. PUBLIC UTILITY COMPANY REBATE	\$	0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$		66699.	

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1993

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	245.	\$ 8558.	8.77	\$ 75057.
B. DIST	\$.00	0.	\$ 0.	9.26	\$ 0.
C. RESID	\$.00	0.	\$ 0.	10.08	\$ 0.
D. NAT G	\$.00	0.	\$ 0.	10.39	\$ 0.
E. COAL	\$.00	0.	\$ 0.	9.39	\$ 0.
F. LPG	\$.00	0.	\$ 0.	8.78	\$ 0.
M. DEMAND SAVINGS			\$ 10077.	8.49	\$ 85554.
N. TOTAL		245.	\$ 18635.		\$ 160611.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$ 5404.
(1) DISCOUNT FACTOR (TABLE A)	8.49	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$ 45880.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-)(4)
------	------------------------------	-----------------	------------------------	---

d. TOTAL	\$ 0.	0.
----------	-------	----

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-)(3A2+3Bd4)\$ 45880.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ 24039.

5. SIMPLE PAYBACK PERIOD (1G/4) 2.77 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 206491.

7. SAVINGS TO INVESTMENT RATIO (SIR)=(6 / 1G)= 3.10
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 15.43 %

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
16 DECEMBER 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 3642 - HANGAR

ELECTRIC COSTS:
ENERGY CHARGE \$0.03495 PER KWH
DEMAND CHARGE \$9.25 PER KW

AREA USE: _____
HOURS/DAY 12
DAYS/WEEK 5

EXISTING FIXTURE DATA

2 FOOT 2 LAMP U @ 92 W/FIXT = 0 WATTS

4 FOOT 2 2 LAMP @ 92 W/FIXT = 184 WATTS
3 LAMP @ 137 W/FIXT = 0 WATTS
4 LAMP @ 184 W/FIXT = 0 WATTS

8 FOOT 29 2 LAMP @ 144 W/FIXT = 4,176 WATTS

REPLACEMENT FIXTURE DATA

2 FOOT 0 2 LAMP U @ 58 W/FIXT = 0 WATTS

4 FOOT 2 2 LAMP @ 58 W/FIXT = 116 WATTS
0 3 LAMP @ 87 W/FIXT = 0 WATTS
0 4 LAMP @ 118 W/FIXT = 0 WATTS

8 FOOT 29 2 LAMP @ 125 W/FIXT = 3,625 WATTS

BASELINE ENERGY CONSUMPTION 13,603 KWH/YR ECO ENERGY CONSUMPTION 11,672 KWH/YR

BASELINE DEMAND 4.36 KW ECO DEMAND 3.74 KW

NET ENERGY SAVINGS 1,931 KWH/YR NET DEMAND SAVINGS \$69 /YR
NET DOLLAR SAVINGS \$136 /YR

MAINTENANCE SAVINGS

_____ LAMPS @ _____ / 20,000 HOURS * _____ HR/YR = \$0 / YEAR (4' FLUORESCENT LAMPS)

NET MAINTENANCE SAVINGS \$0 /YEAR

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
16 DECEMBER 1994

INTERIOR LIGHTING: LIGHTING REPLACEMENT

BUILDING #: 3642 - HANGAR

AREA USE: _____

HOURS/DAY: 12

DAYS/WEEK: 5

PEAK USE: 1 (1-YES, 0-NO)

ELECTRIC COSTS: \$0.03495 PER KWH

ENERGY CHARGE: \$9.25 PER KW

DEMAND CHARGE: _____

EXISTING FIXTURE DATA

74 INCAND @ 200 WATTS = 14,800 WATTS

41 INCAND @ 750 WATTS = 30,750 WATTS

41 MV @ 1075 WATTS = 44,075 WATTS

MV @ _____ WATTS = 0 WATTS

REPLACEMENT FIXTURE DATA

37 2 LAMP @ 58 W/FIXT = 2,146 WATTS
(FOUR FOOT FLUORESCENT FIXTURES)

41 MH @ 450 WATTS = 18,450 WATTS

41 HPS @ 300 WATTS = 12,300 WATTS

0 HPS @ _____ WATTS = 0 WATTS

BASELINE ENERGY CONSUMPTION 279,630 KWH/YR ECO ENERGY CONSUMPTION 102,636 KWH/YR

BASELINE DEMAND 89.63 KW ECO DEMAND 32.90 KW

NET ENERGY SAVINGS 176,994 KWH/YR

NET DEMAND SAVINGS \$6,297 /YR

NET DOLLAR SAVINGS \$12,483 /YR

MAINTENANCE SAVINGS

74 LAMPS @ \$5.25	/ 1,000 HOURS *	3,120	HR/YR =	\$1,212 / YEAR	(EXISTING INCANDESCENT)
41 LAMPS @ \$26.00	/ 1,000 HOURS *	3,120	HR/YR =	\$3,326 / YEAR	(EXISTING INCANDESCENT)
41 LAMPS @ \$70.00	/ 24,000 HOURS *	3,120	HR/YR =	\$373 / YEAR	(EXISTING MERCURY VAPOR)
74 LAMPS @ \$5.00	/ 20,000 HOURS *	3,120	HR/YR =	\$58 / YEAR	(FLUORESCENT)
41 LAMPS @ \$47.00	/ 20,000 HOURS *	3,120	HR/YR =	\$301 / YEAR	(METAL HALIDE)
41 LAMPS @ \$38.00	/ 24,000 HOURS *	3,120	HR/YR =	\$203 / YEAR	(HIGH PRESSURE SODIUM)

NET MAINTENANCE SAVINGS \$4,349 /YEAR

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
16 DECEMBER 1994

INTERIOR LIGHTING: INCANDESCENT LAMP REPLACEMENT

BUILDING #: 3642 - HANGAR

AREA USE: _____

HOURS/DAY: 12

DAYS/WEEK: 5

PEAK USE: 1 (1-YES, 0-NO)

ELECTRIC COSTS: \$0.03495 PER KWH

ENERGY CHARGE: \$9.25 PER KW

DEMAND CHARGE: _____

EXISTING INCANDESCENTS

LAMPS @ 52 W/FIXT = 0 WATTS

39 LAMPS @ 60 W/FIXT = 2,340 WATTS

15 LAMPS @ 75 W/FIXT = 1,125 WATTS

LAMPS @ 90 W/FIXT = 0 WATTS

LAMPS @ 100 W/FIXT = 0 WATTS

COMPACT FLUORESCENT REPLACEMENT

0 LAMPS @ 13 W/FIXT = 0 WATTS

39 LAMPS @ 13 W/FIXT = 507 WATTS

15 LAMPS @ 18 W/FIXT = 270 WATTS

0 LAMPS @ 26 W/FIXT = 0 WATTS

0 LAMPS @ 26 W/FIXT = 0 WATTS

BASELINE ENERGY CONSUMPTION 10,811 KWH/YR

ECO ENERGY CONSUMPTION 2,424 KWH/YR

BASELINE DEMAND 3.47 KW

ECO DEMAND 0.78 KW

NET ENERGY SAVINGS 8,387 KWH/YR

NET DEMAND SAVINGS \$298 /YR

NET DOLLAR SAVINGS \$591 /YR

MAINTENANCE SAVINGS

54 LAMPS @ \$3.50 / 750 HOURS = 3,120 HR/YR = \$786 / YEAR (INCANDESCENT)

54 LAMPS @ \$2.00 / 10,000 HOURS = 3,120 HR/YR = \$34 / YEAR (COMPACT FLUORESCENT)

NET MAINTENANCE SAVINGS \$752 /YEAR

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
02 FEBRUARY 1995

CONVENTIONAL SKY LIGHTS IN HANGARS

BUILDING #: 3642 - HANGAR

ELECTRIC COSTS:
ENERGY CHARGE \$0.03495 PER KWH
DEMAND CHARGE \$9.25 PER KW

WATTAGE CONTROLLED: 30,750 W
PEAK USE: 1 (1-YES, 0-NO)

CURRENT USAGE: 3,120
HOURS/YEAR REVISED USAGE: 1,248
HOURS/YEAR

BASELINE ENERGY CONSUMPTION	95,940 KWH/YR	ECO ENERGY CONSUMPTION	38,376 KWH/YR
BASELINE DEMAND	30.75 KW	ECO DEMAND	30.75 KW

NET ENERGY SAVINGS	57,564 KWH/YR	NET DEMAND SAVINGS	\$3,413 /YR
		NET DOLLAR SAVINGS	\$5,425 /YR

MAINTENANCE SAVINGS

41 LAMPS @ \$38.00	/ 24,000 HOURS *	3,120 HRYR =	\$203 / YEAR	(WITHOUT SKYLIGHTS)
41 LAMPS @ \$47.00	/ 20,000 HOURS *	3,120 HRYR =	\$301 / YEAR	(WITHOUT SKYLIGHTS)
41 LAMPS @ \$38.00	/ 24,000 HOURS *	1,248 HRYR =	\$81 / YEAR	(WITH SKYLIGHTS)
41 LAMPS @ \$47.00	/ 20,000 HOURS *	1,248 HRYR =	\$120 / YEAR	(WITH SKYLIGHTS)

NET MAINTENANCE SAVINGS \$303 /YEAR

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Estimate:      LIGHTING UPGRADE   Date:      FEBRUARY 2, 1995
Description:   LIGHTING PRODUCT UPGRADE
Project:       HANGAR LIGHTING   Bid Date:  FEBRUARY 2, 1995
Location:     BLDG 3642         Job #:    94013.04
Sq. footage:   City indx:Raleigh, NC
=====

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Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0002010000	DEMOLITION, INCANDESCENT FIXTURES/EXIT SIGNS					128.00	FIXTURE
Unit values	0.26	0.00	7.10	0.00	0.00		7.10
Totals	33.28	\$0	\$909	\$0	\$0		\$909
0002020000	DEMOLITION, 1X4 FLUORESCENT FIXTURES					31.00	FIXTURE
Unit values	0.49	0.00	13.35	0.00	0.00		13.35
Totals	15.19	\$0	\$414	\$0	\$0		\$414
0002030000	DEMOLITION, HIGH BAY FIXTURES					82.00	FIXTURE
Unit values	1.00	0.00	27.50	0.00	0.00		27.50
Totals	82.00	\$0	\$2,255	\$0	\$0		\$2,255
0010000000	1X4 2-32 WATT FLUORESCENT LAMPS, SURFACE MOUNTED					37.00	FIXTURE
Unit values	1.14	60.00	31.50	0.00	0.00		91.50
Totals	42.18	\$2,220	\$1,166	\$0	\$0		\$3,386
0010400000	1X4 2-32 WATT FLUORESCENT LAMPS, PENDANT MOUNTED					2.00	FIXTURE
Unit values	1.14	39.00	31.50	0.00	0.00		70.50
Totals	2.28	\$78	\$63	\$0	\$0		\$141
0010600000	1X8 2-59 WATT FLUORESCENT LAMPS, PENDANT MOUNTED					29.00	FIXTURE
Unit values	1.75	131.00	48.12	0.00	0.00		179.12
Totals	50.75	\$3,799	\$1,395	\$0	\$0		\$5,194
0011000000	400 WATT METAL HALIDE FIXTURE					41.00	FIXTURE
Unit values	2.00	207.00	55.00	0.00	0.00		262.00
Totals	82.00	\$8,487	\$2,255	\$0	\$0		\$10,742
0011100000	13 WATT COMPACT FLUORESCENT FIXTURE GLOBE ASSEMBLY					39.00	FIXTURE
Unit values	0.13	25.50	3.44	0.00	0.00		28.94
Totals	5.07	\$995	\$134	\$0	\$0		\$1,129
0011200000	18 WATT COMPACT FLUORESCENT FIXTURE GLOBE ASSEMBLY					15.00	FIXTURE

02-Feb-95

MeansData for Lotus

Page 2

Unit values	0.13	25.50	3.44	0.00	0.00	28.94
Totals	1.95	\$383	\$52	\$0	\$0	\$435

0011300000	250 WATT HIGH PRESSURE SODIUM FIXTURE WITH COLOR CORRECTION					41.00 FIXTURE
Unit values	2.00	214.00	55.00	0.00	0.00	269.00
Totals	82.00	\$8,774	\$2,255	\$0	\$0	\$11,029

```
=====
Line #      Description
-----
      Manhours   Matl     Labor   Equipment   Sub     Total
=====
U00          397    $24,736   $10,898         $0        $0    $35,634

ESTIMATE TOTAL      397    $24,736   $10,898         $0        $0    $35,634

SALES TAX           5.00%    $1,237
MATL MARKUP         0.00%         $0
LABOR MARKUP        0.00%         $0
EQUIPT MARKUP       0.00%         $0
SUB MARKUP          0.00%         $0

TOTAL BEFORE CONTINGENC $25,973   $10,898         $0        $0    $36,871
CONTINGENCY           5.00%         $1,844
BOND                  5.00%         $1,844
PROFIT               10.00%         $3,687

JOB TOTAL                                     $44,245
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=====
Estimate:      LIGHTING UPGRADE   Date:      FEBRUARY 2, 1995
Description:   LIGHTING PRODUCT UPGRADE
Project:       HANGAR LIGHTING   Bid Date:  FEBRUARY 2, 1995
Location:     BLDG 3642          Job #:      94013.04
Sq. footage:   City indx:Raleigh, NC
=====

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SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
U00	397	\$24,736	\$10,898	\$0	\$0	\$35,634
TOTAL	397	\$24,736	\$10,898	\$0	\$0	\$35,634
SALES TAX	5.00%	\$1,237				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$25,973	\$10,898	\$0	\$0	\$36,871
CONTINGENCY	5.00%					\$1,844
BOND	5.00%					\$1,844
PROFIT	10.00%					\$3,687
JOB TOTAL						\$44,245

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=====
Estimate:      BLDG 3642      Date:      FEBRUARY 2, 1995
Description:    CONVENTIONAL SKYLIGHT & CONTROLS
Project:        HANGAR STUDY      Bid Date: FEBRUARY 2, 1995
Location:       BLDG 3642      Job #:      94013.04
Sq. footage:    City indx:Raleigh, NC
=====

```

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0060000001	CONVENTIONAL SKYLIGHT WITH 4" INSULATED CURBS (DOUBLE PANED)					450.00 SQ. FT	
Unit values		0.00	19.56	2.41	0.09	0.00	22.06
Totals		0.00	\$8,802	\$1,085	\$41	\$0	\$9,928
U00		0	\$8,802	\$1,085	\$41	\$0	\$9,928

LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 3807

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) LCCID FY95 (92)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 3807 SKY LIGHTS & LIGHTING PRODUCTS @ HANGARS

FISCAL YEAR 95 DISCRETE PORTION NAME: LIGHTING

ANALYSIS DATE: 02-03-95 ECONOMIC LIFE 10 YEARS PREPARED BY: JAH

1. INVESTMENT

A. CONSTRUCTION COST	\$	53422.	
B. SIOH	\$	2671.	
C. DESIGN COST	\$	2671.	
D. TOTAL COST (1A+1B+1C)	\$	58764.	
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.	
F. PUBLIC UTILITY COMPANY REBATE	\$	0.	
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$		58764.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1993

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	121.	\$ 4238.	8.77	\$ 37167.
B. DIST	\$.00	0.	\$ 0.	9.26	\$ 0.
C. RESID	\$.00	0.	\$ 0.	10.08	\$ 0.
D. NAT G	\$.00	0.	\$ 0.	10.39	\$ 0.
E. COAL	\$.00	0.	\$ 0.	9.39	\$ 0.
F. LPG	\$.00	0.	\$ 0.	8.78	\$ 0.
M. DEMAND SAVINGS			\$ 3838.	8.49	\$ 32585.
N. TOTAL		121.	\$ 8076.		\$ 69751.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$ 747.
(1) DISCOUNT FACTOR (TABLE A)	8.49	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$ 6342.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-)(4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-)(3A2+3Bd4)\$ 6342.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ 8823.

5. SIMPLE PAYBACK PERIOD (1G/4) 6.66 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 76093.

7. SAVINGS TO INVESTMENT RATIO (SIR)=(6 / 1G)= 1.29
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 5.80 %

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
16 DECEMBER 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 3807 - HANGAR

ELECTRIC COSTS:
ENERGY CHARGE \$0.03495 PER KWH
DEMAND CHARGE \$9.25 PER KW

AREA USE: _____
HOURS/DAY 18
DAYS/WEEK 7

EXISTING FIXTURE DATA

2 FOOT 2 LAMP U @ 92 W/FIXT = 0 WATTS

4 FOOT

1 LAMP @ 45 W/FIXT = 0 WATTS

163 2 LAMP @ 92 W/FIXT = 14,996 WATTS

22 3 LAMP @ 137 W/FIXT = 3,014 WATTS

4 LAMP @ 184 W/FIXT = 0 WATTS

8 FOOT 2 LAMP @ 144 W/FIXT = 0 WATTS

REPLACEMENT FIXTURE DATA

2 FOOT 0 2 LAMP U @ 58 W/FIXT = 0 WATTS

4 FOOT

0 2 LAMP @ 29 W/FIXT = 0 WATTS

185 2 LAMP @ 58 W/FIXT = 10,730 WATTS

0 3 LAMP @ 87 W/FIXT = 0 WATTS

0 4 LAMP @ 118 W/FIXT = 0 WATTS

8 FOOT 0 2 LAMP @ 125 W/FIXT = 0 WATTS

BASELINE ENERGY CONSUMPTION 118,002 KWH/YR ECO ENERGY CONSUMPTION 70,303 KWH/YR

BASELINE DEMAND 18.01 KW ECO DEMAND 10.73 KW

NET ENERGY SAVINGS	47,699 KWH/YR	NET DEMAND SAVINGS \$808 /YR
		NET DOLLAR SAVINGS \$2,475 /YR

MAINTENANCE SAVINGS

22 LAMPS @ \$5.00 / 20,000 HOURS * 6,570 HR/YR = \$36 / YEAR (4' FLUORESCENT LAMPS)

NET MAINTENANCE SAVINGS \$36 /YEAR

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
16 DECEMBER 1994

INTERIOR LIGHTING: EXIT SIGN REPLACEMENT

BUILDING #: 3807 - HANGAR

ELECTRIC COSTS:
ENERGY CHARGE \$0.03495 PER KWH
DEMAND CHARGE \$9.25 PER KW

INCANDESCENT EXIT SIGNS	FLUORESCENT EXIT SIGNS	REPLACEMENT SIGNS
# OF EXIT SIGNS: 11	# OF EXIT SIGNS: 0	# OF EXIT SIGNS: 11
WATTAGE: 30	WATTAGE: 18	WATTAGE: 3
BASELINE ENERGY CONSUMPTION	2,891 KWH/YR	ECO ENERGY CONSUMPTION
BASELINE DEMAND	0.33 KW	ECO DEMAND
		289 KWH/YR
		0.03 KW

NET ENERGY SAVINGS	2,602 KWH/YR	NET DEMAND SAVINGS
		NET DOLLAR SAVINGS
		\$33 /YR
		\$124 /YR

MAINTENANCE SAVINGS

11 LAMPS @ \$3.50 / 1,000 HOURS *	8,760 HR/YR =	\$337 / YEAR
LAMPS @ / 10,000 HOURS *	HR/YR =	\$0 / YEAR
		(INCANDESCENT)
		(COMPACT FLUORESCENT)

NET MAINTENANCE SAVINGS \$337 /YEAR

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
02 FEBRUARY 1995

CONVENTIONAL SKY LIGHTS IN HANGARS

BUILDING #: 3807 - HANGAR

ELECTRIC COSTS:
ENERGY CHARGE \$0.03495 PER KWH
DEMAND CHARGE \$9.25 PER KW

WATTAGE CONTROLLED: 27,000 W
PEAK USE: 1 (1-YES, 0-NO)

CURRENT USAGE: 6,570
HOURS/YEAR

REVISED USAGE: 3,942
HOURS/YEAR

BASELINE ENERGY CONSUMPTION	177,390 KWH/YR	ECO ENERGY CONSUMPTION	106,434 KWH/YR
BASELINE DEMAND	27 KW	ECO DEMAND	27 KW

NET ENERGY SAVINGS	70,956 KWH/YR	NET DEMAND SAVINGS	\$2,997 /YR
		NET DOLLAR SAVINGS	\$5,477 /YR

MAINTENANCE SAVINGS

90 LAMPS @ \$38.00 / 24,000 HOURS *	6,570 HR/YR =	\$936 / YEAR (WITHOUT SKYLIGHTS)
90 LAMPS @ \$38.00 / 24,000 HOURS *	3,942 HR/YR =	\$562 / YEAR (WITH SKYLIGHTS)

NET MAINTENANCE SAVINGS \$374 /YEAR

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Estimate:      LIGHTING UPGRADE   Date:      FEBRUARY 2, 1995
Description:   LIGHTING PRODUCT UPGRADE
Project:       HANGAR LIGHTING   Bid Date:  FEBRUARY 2, 1995
Location:      BLDG 3807         Job #:     94013.04
Sq. footage:   City indx:Raleigh, NC
=====

```

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0002000000	DEMOLITION, 2X4 FLUORESCENT FIXTURES					148.00	FIXTURE
Unit values	0.49	0.00	13.35	0.00	0.00		13.35
Totals	72.52	\$0	\$1,976	\$0	\$0		\$1,976
0002010000	DEMOLITION, INCANDESCENT FIXTURES/EXIT SIGNS					11.00	FIXTURE
Unit values	0.26	0.00	7.10	0.00	0.00		7.10
Totals	2.86	\$0	\$78	\$0	\$0		\$78
0002020000	DEMOLITION, 1X4 FLUORESCENT FIXTURES					37.00	FIXTURE
Unit values	0.49	0.00	13.35	0.00	0.00		13.35
Totals	18.13	\$0	\$494	\$0	\$0		\$494
0010100000	2X4 2-32 WATT FLUORESCENT LAMPS, RECESSED MOUNTED					126.00	FIXTURE
Unit values	1.51	59.00	41.50	0.00	0.00		100.50
Totals	190.26	\$7,434	\$5,229	\$0	\$0		\$12,663
0010300000	1X4 2-32 WATT FLUORESCENT LAMPS, WALL MOUNTED					26.00	FIXTURE
Unit values	1.14	60.00	31.50	0.00	0.00		91.50
Totals	29.64	\$1,560	\$819	\$0	\$0		\$2,379
0010400000	1X4 2-32 WATT FLUORESCENT LAMPS, PENDANT MOUNTED					11.00	FIXTURE
Unit values	1.14	39.00	31.50	0.00	0.00		70.50
Totals	12.54	\$429	\$347	\$0	\$0		\$776
0010500000	2X4 2-32 WATT FLUORESCENT LAMPS, RECESSED MOUNTED WITH REFLECTORS					22.00	FIXTURE
Unit values	1.51	75.00	41.50	0.00	0.00		116.50
Totals	33.22	\$1,650	\$913	\$0	\$0		\$2,563
0010700000	LED EXIT SIGN, RETROFIT KIT					11.00	FIXTURE
Unit values	1.00	35.00	27.50	0.00	0.00		62.50
Totals	11.00	\$385	\$303	\$0	\$0		\$688

02-Feb-95

MeansData for Lotus

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=====
Line #      Description
-----
           Manhours  Matl    Labor  Equipment  Sub    Total
=====
U00          371    $11,458  $10,159         $0        $0    $21,617

ESTIMATE TOTAL      371    $11,458  $10,159         $0        $0    $21,617

SALES TAX           5.00%         $573
MATL MARKUP         0.00%         $0
LABOR MARKUP        0.00%         $0
EQUIPT MARKUP       0.00%         $0
SUB MARKUP          0.00%         $0

TOTAL BEFORE CONTINGENC  $12,031  $10,159         $0        $0    $22,190
CONTINGENCY           5.00%         $1,109
BOND                  5.00%         $1,109
PROFIT               10.00%         $2,219

JOB TOTAL                                     $26,628
```

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=====
Estimate:    LIGHTING UPGRADE   Date:    FEBRUARY 2, 1995
Description: LIGHTING PRODUCT UPGRADE
Project:     HANGAR LIGHTING   Bid Date: FEBRUARY 2, 1995
Location:    BLDG 3807         Job #:    94013.04
Sq. footage:                      City indx:Raleigh, NC
=====

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SUMMARY

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=====
Manhours    Matl    Labor    Equipment    Sub    Total
=====
U00          371    $11,458    $10,159          $0          $0    $21,617
TOTAL        371    $11,458    $10,159          $0          $0    $21,617

SALES TAX      5.00%      $573
MATL MARKUP    0.00%      $0
LABOR MARKUP   0.00%          $0
EQUIPT MARKUP  0.00%          $0
SUB MARKUP     0.00%          $0

TOTAL BEFORE CONTINGENC  $12,031    $10,159          $0          $0    $22,190
CONTINGENCY      5.00%          $1,109
BOND              5.00%          $1,109
PROFIT           10.00%          $2,219

JOB TOTAL                                $26,628

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=====
Estimate:      BLDG 3807          Date:      FEBRUARY 2, 1995
Description:    CONVENTIONAL SKYLIGHT & CONTROLS
Project:        HANGAR STUDY      Bid Date:  FEBRUARY 2, 1995
Location:       BLDG 3807         Job #:     94013.04
Sq. footage:    City indx:Raleigh, NC
=====

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Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0060000001	CONVENTIONAL SKYLIGHT WITH 4" INSULATED CURBS (DOUBLE PANED)						
Unit values		0.00	19.56	2.41	0.09	0.00	22.06
Totals		0.00	\$15,257	\$1,880	\$70	\$0	\$17,207
U00		0	\$15,257	\$1,880	\$70	\$0	\$17,207

=====						
Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1611350023	LOW VOLTAGE WIRE #18-4C					
Unit values	1.23	15.40	34.00	0.00	14.00 CLF	
Totals	17.22	\$216	\$476	\$0	0.00	49.40
					\$0	\$692
1611750101	LIGHTING CONTACTOR					
Unit values	2.00	137.00	55.00	0.00	6.00 EA.	
Totals	12.00	\$822	\$330	\$0	0.00	192.00
					\$0	\$1,152
1611850101	PHOTO SWITCH 50-500 FC ADJUSTABLE					
Unit values	1.00	290.00	27.50	0.00	4.00 EA.	
Totals	4.00	\$1,160	\$110	\$0	0.00	317.50
					\$0	\$1,270
1611870101	LOW VOLTAGE TRANS 115V-24V					
Unit values	0.67	64.00	18.35	0.00	1.00 EA.	
Totals	0.67	\$64	\$18	\$0	0.00	82.35
					\$0	\$82
1611870102	SWITCHING RELAYS					
Unit values	0.50	11.30	13.75	0.00	8.00 EA.	
Totals	4.00	\$90	\$110	\$0	0.00	25.05
					\$0	\$200
1611950101	1/2" EMT					
Unit values	0.05	0.38	1.29	0.00	500.00 LF	
Totals	25.00	\$190	\$645	\$0	0.00	1.67
					\$0	\$835
U16 ELECTRICAL	63	\$2,542	\$1,689	\$0	\$0	\$4,231

```
=====
Line #      Description
-----
      Manhours   Matl    Labor   Equipment   Sub    Total
=====
```

ESTIMATE TOTAL	63	\$17,799	\$3,569	\$70	\$0	\$21,438
SALES TAX	5.00%	\$890				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$18,689	\$3,569	\$70	\$0	\$22,328
CONTINGENCY	5.00%					\$1,116
BOND	5.00%					\$1,116
PROFIT	10.00%					\$2,233
JOB TOTAL						\$26,794

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Estimate:      BLDG 3807           Date:      FEBRUARY 2, 1995
Description:   CONVENTIONAL SKYLIGHT & CONTROLS
Project:       HANGAR STUDY       Bid Date:  FEBRUARY 2, 1995
Location:     BLDG 3807          Job #:      94013.04
Sq. footage:   City indx:Raleigh, NC
=====

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SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
U00	0	\$15,257	\$1,880	\$70	\$0	\$17,207
U16 ELECTRICAL	63	\$2,542	\$1,689	\$0	\$0	\$4,231
TOTAL	63	\$17,799	\$3,569	\$70	\$0	\$21,438
SALES TAX	5.00%	\$890				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$18,689	\$3,569	\$70	\$0	\$22,328
CONTINGENCY	5.00%					\$1,116
BOND	5.00%					\$1,116
PROFIT	10.00%					\$2,233
JOB TOTAL						\$26,794

LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 3954

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) LCCID FY95 (92)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 3954 SKY LIGHTS & LIGHTING PRODUCTS @ HANGARS

FISCAL YEAR 95 DISCRETE PORTION NAME: LIGHTING

ANALYSIS DATE: 02-03-95 ECONOMIC LIFE 10 YEARS PREPARED BY: JAH

1. INVESTMENT

A. CONSTRUCTION COST	\$	29241.		
B. SIOH	\$	1462.		
C. DESIGN COST	\$	1462.		
D. TOTAL COST (1A+1B+1C)	\$	32165.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.		
F. PUBLIC UTILITY COMPANY REBATE	\$	0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$			32165.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1993

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	54.	\$ 1875.	8.77	\$ 16446.
B. DIST	\$.00	0.	\$ 0.	9.26	\$ 0.
C. RESID	\$.00	0.	\$ 0.	10.08	\$ 0.
D. NAT G	\$.00	0.	\$ 0.	10.39	\$ 0.
E. COAL	\$.00	0.	\$ 0.	9.39	\$ 0.
F. LPG	\$.00	0.	\$ 0.	8.78	\$ 0.
M. DEMAND SAVINGS			\$ 2748.	8.49	\$ 23331.
N. TOTAL		54.	\$ 4623.		\$ 39776.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$	254.
(1) DISCOUNT FACTOR (TABLE A)	8.49		
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$	2156.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-)(4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-)(3A2+3Bd4)\$ 2156.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ 4877.

5. SIMPLE PAYBACK PERIOD (1G/4) 6.59 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 41933.

7. SAVINGS TO INVESTMENT RATIO (SIR)=(6 / 1G)= 1.30
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 5.87 %

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING

16 DECEMBER 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 3954 - HANGAR

ELECTRIC COSTS:

ENERGY CHARGE \$0.03495 PER KWH
DEMAND CHARGE \$9.25 PER KW

AREA USE: _____
HOURS/DAY 12
DAYS/WEEK 5

EXISTING FIXTURE DATA

2 FOOT 2 LAMP U @ 92 W/FIXT = 0 WATTS

4 FOOT 11 2 LAMP @ 92 W/FIXT = 1,012 WATTS
3 LAMP @ 137 W/FIXT = 0 WATTS
53 4 LAMP @ 184 W/FIXT = 9,752 WATTS

8 FOOT 12 2 LAMP @ 144 W/FIXT = 1,728 WATTS

REPLACEMENT FIXTURE DATA

2 FOOT 0 2 LAMP U @ 58 W/FIXT = 0 WATTS

4 FOOT 11 2 LAMP @ 58 W/FIXT = 638 WATTS
53 3 LAMP @ 87 W/FIXT = 4,611 WATTS
0 4 LAMP @ 118 W/FIXT = 0 WATTS

8 FOOT 12 2 LAMP @ 125 W/FIXT = 1,500 WATTS

BASELINE ENERGY CONSUMPTION 38,975 KWH/YR ECO ENERGY CONSUMPTION 21,057 KWH/YR

BASELINE DEMAND 12.49 KW ECO DEMAND 6.75 KW

NET ENERGY SAVINGS 17,918 KWH/YR NET DEMAND SAVINGS \$637 /YR
NET DOLLAR SAVINGS \$1,264 /YR

MAINTENANCE SAVINGS

53 LAMPS @ \$5.00 / 20,000 HOURS * 3,120 HR/YR = \$41 / YEAR (4' FLUORESCENT LAMPS)

NET MAINTENANCE SAVINGS \$41 /YEAR

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
16 DECEMBER 1994

INTERIOR LIGHTING: INCANDESCENT LAMP REPLACEMENT

BUILDING #: 3954 - HANGAR

AREA USE: _____

HOURS/DAY: 12

DAYS/WEEK: 5

PEAK USE: 1 (1-YES, 0-NO)

ELECTRIC COSTS:
ENERGY CHARGE: \$0.03495 PER KWH
DEMAND CHARGE: \$9.25 PER KW

EXISTING INCANDESCENTS

LAMPS @ 52 W/FIXT = 0 WATTS

LAMPS @ 60 W/FIXT = 0 WATTS

2 LAMPS @ 75 W/FIXT = 150 WATTS

LAMPS @ 90 W/FIXT = 0 WATTS

LAMPS @ 100 W/FIXT = 0 WATTS

COMPACT FLUORESCENT REPLACEMENT

0 LAMPS @ 13 W/FIXT = 0 WATTS

0 LAMPS @ 13 W/FIXT = 0 WATTS

2 LAMPS @ 18 W/FIXT = 36 WATTS

0 LAMPS @ 26 W/FIXT = 0 WATTS

0 LAMPS @ 26 W/FIXT = 0 WATTS

BASELINE ENERGY CONSUMPTION 468 KWH/YR ECO ENERGY CONSUMPTION 112 KWH/YR

BASELINE DEMAND 0.15 KW ECO DEMAND 0.04 KW

NET ENERGY SAVINGS 356 KWH/YR NET DEMAND SAVINGS \$13 /YR

NET DOLLAR SAVINGS \$25 /YR

MAINTENANCE SAVINGS

2 LAMPS @ \$3.50 / 750 HOURS * 3,120 HRYR = \$29 / YEAR (INCANDESCENT)

2 LAMPS @ \$2.00 / 10,000 HOURS * 3,120 HRYR = \$1 / YEAR (COMPACT FLUORESCENT)

NET MAINTENANCE SAVINGS \$28 /YEAR

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
02 FEBRUARY 1995

CONVENTIONAL SKY LIGHTS IN HANGARS

BUILDING #: 3954 - HANGAR

ELECTRIC COSTS:
ENERGY CHARGE \$0.03495 PER KWH
DEMAND CHARGE \$9.25 PER KW

WATTAGE CONTROLLED: 18,900 W
PEAK USE: 1 (1-YES, 0-NO)

CURRENT USAGE:
HOURS/YEAR 3,120

REVISED USAGE:
HOURS/YEAR 1,248

BASELINE ENERGY CONSUMPTION	58,968	KWH/YR	ECO ENERGY CONSUMPTION	23,587	KWH/YR
BASELINE DEMAND	18.9	KW	ECO DEMAND	18.9	KW

NET ENERGY SAVINGS	35,381	KWH/YR	NET DEMAND SAVINGS	\$2,098	/YR
			NET DOLLAR SAVINGS	\$3,334	/YR

MAINTENANCE SAVINGS

42 LAMPS @ \$47.00 / 20,000 HOURS *	3,120	HR/YR =	\$308	/ YEAR	(WITHOUT SKYLIGHTS)
42 LAMPS @ \$47.00 / 20,000 HOURS *	1,248	HR/YR =	\$123	/ YEAR	(WITH SKYLIGHTS)

NET MAINTENANCE SAVINGS \$185 /YEAR

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=====
Estimate:      LIGHTING UPGRADE   Date:      FEBRUARY 2, 1995
Description:    LIGHTING PRODUCT UPGRADE
Project:        HANGAR LIGHTING   Bid Date:  FEBRUARY 2, 1995
Location:       BLDG 3954         Job #:     94013.04
Sq. footage:    City indx:Raleigh, NC
=====

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Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0002000000	DEMOLITION, 2X4 FLUORESCENT FIXTURES					53.00	FIXTURE
Unit values	0.49	0.00	13.35	0.00	0.00		13.35
Totals	25.97	\$0	\$708	\$0	\$0		\$708
0002010000	DEMOLITION, INCANDESCENT FIXTURES/EXIT SIGNS					2.00	FIXTURE
Unit values	0.26	0.00	7.10	0.00	0.00		7.10
Totals	0.52	\$0	\$14	\$0	\$0		\$14
0002020000	DEMOLITION, 1X4 FLUORESCENT FIXTURES					23.00	FIXTURE
Unit values	0.49	0.00	13.35	0.00	0.00		13.35
Totals	11.27	\$0	\$307	\$0	\$0		\$307
0010000000	1X4 2-32 WATT FLUORESCENT LAMPS, SURFACE MOUNTED					10.00	FIXTURE
Unit values	1.14	60.00	31.50	0.00	0.00		91.50
Totals	11.40	\$600	\$315	\$0	\$0		\$915
0010400000	1X4 2-32 WATT FLUORESCENT LAMPS, PENDANT MOUNTED					1.00	FIXTURE
Unit values	1.14	39.00	31.50	0.00	0.00		70.50
Totals	1.14	\$39	\$32	\$0	\$0		\$71
0010500000	2X4 2-32 WATT FLUORESCENT LAMPS, RECESSED MOUNTED WITH REFLECTORS					53.00	FIXTURE
Unit values	1.51	75.00	41.50	0.00	0.00		116.50
Totals	80.03	\$3,975	\$2,200	\$0	\$0		\$6,175
0010600000	1X8 2-59 WATT FLUORESCENT LAMPS, PENDANT MOUNTED					12.00	FIXTURE
Unit values	1.75	131.00	48.12	0.00	0.00		179.12
Totals	21.00	\$1,572	\$577	\$0	\$0		\$2,149
0011200000	18 WATT COMPACT FLUORESCENT FIXTURE GLOBE ASSEMBLY					2.00	FIXTURE
Unit values	0.13	25.50	3.44	0.00	0.00		28.94
Totals	0.26	\$51	\$7	\$0	\$0		\$58

02-Feb-95

MeansData for Lotus

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=====
Line #      Description
-----
      Manhours   Matl    Labor   Equipment   Sub    Total
=====
U00          152    $6,237    $4,160         $0        $0    $10,397

ESTIMATE TOTAL      152    $6,237    $4,160         $0        $0    $10,397

SALES TAX           5.00%      $312
MATL MARKUP         0.00%        $0
LABOR MARKUP        0.00%          $0
EQUIPT MARKUP       0.00%         $0
SUB MARKUP          0.00%          $0

TOTAL BEFORE CONTINGENC    $6,549    $4,160         $0        $0    $10,709
CONTINGENCY              5.00%          $535
BOND                     5.00%          $535
PROFIT                   10.00%         $1,071

JOB TOTAL                                     $12,851
=====
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=====
Estimate:      LIGHTING UPGRADE   Date:      FEBRUARY 2, 1995
Description:   LIGHTING PRODUCT UPGRADE
Project:       HANGAR LIGHTING   Bid Date:  FEBRUARY 2, 1995
Location:      BLDG 3954         Job #:     94013.04
Sq. footage:   City indx:Raleigh, NC
=====

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SUMMARY

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=====
              Manhours   Matl      Labor    Equipment   Sub      Total
=====
U00              152      $6,237    $4,160          $0          $0    $10,397
TOTAL            152      $6,237    $4,160          $0          $0    $10,397

SALES TAX          5.00%      $312
MATL MARKUP        0.00%        $0
LABOR MARKUP       0.00%          $0
EQUIPT MARKUP      0.00%          $0
SUB MARKUP         0.00%          $0

TOTAL BEFORE CONTINGENC $6,549    $4,160          $0          $0    $10,709
CONTINGENCY         5.00%          $535
BOND                5.00%          $535
PROFIT              10.00%         $1,071

JOB TOTAL                                $12,851

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=====
Estimate:      BLDG 3954      Date:      FEBRUARY 2, 1995
Description:   CONVENTIONAL SKYLIGHT & CONTROLS
Project:      HANGAR STUDY   Bid Date: FEBRUARY 2, 1995
Location:     BLDG 3954     Job #:    94013.04
Sq. footage:   City indx:Raleigh, NC
=====

```

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0060000001	CONVENTIONAL SKYLIGHT WITH 4" INSULATED CURBS (DOUBLE PANED)						
Unit values		0.00	19.56	2.41	0.09	0.00	450.00 SQ. FT
Totals		0.00	\$8,802	\$1,085	\$41	\$0	22.06 \$9,928
U00		0	\$8,802	\$1,085	\$41	\$0	\$9,928

=====						
Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1611350023	LOW VOLTAGE WIRE #18-4C					
Unit values	1.23	15.40	34.00	0.00	10.00 CLF	
Totals	12.30	\$154	\$340	\$0	0.00	49.40
					\$0	\$494
1611750101	LIGHTING CONTACTOR					
Unit values	2.00	137.00	55.00	0.00	3.00 EA.	
Totals	6.00	\$411	\$165	\$0	0.00	192.00
					\$0	\$576
1611850101	PHOTO SWITCH 50-500 FC ADJUSTABLE					
Unit values	1.00	290.00	27.50	0.00	4.00 EA.	
Totals	4.00	\$1,160	\$110	\$0	0.00	317.50
					\$0	\$1,270
1611870101	LOW VOLTAGE TRANS 115V-24V					
Unit values	0.67	64.00	18.35	0.00	1.00 EA.	
Totals	0.67	\$64	\$18	\$0	0.00	82.35
					\$0	\$82
1611870102	SWITCHING RELAYS					
Unit values	0.50	11.30	13.75	0.00	8.00 EA.	
Totals	4.00	\$90	\$110	\$0	0.00	25.05
					\$0	\$200
1611950101	1/2" EMT					
Unit values	0.05	0.38	1.29	0.00	340.00 LF	
Totals	17.00	\$129	\$439	\$0	0.00	1.67
					\$0	\$568
U16 ELECTRICAL	44	\$2,008	\$1,182	\$0	\$0	\$3,190


```
=====
Line #      Description
-----
      Manhours  Matl    Labor  Equipment  Sub    Total
=====
```

ESTIMATE TOTAL	44	\$10,810	\$2,267	\$41	\$0	\$13,118
SALES TAX	5.00%	\$541				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$11,351	\$2,267	\$41	\$0	\$13,659
CONTINGENCY	5.00%					\$683
BOND	5.00%					\$683
PROFIT	10.00%					\$1,366
JOB TOTAL						\$16,390

```

=====
Estimate:      BLDG 3954          Date:      FEBRUARY 2, 1995
Description:   CONVENTIONAL SKYLIGHT & CONTROLS
Project:       HANGAR STUDY      Bid Date:  FEBRUARY 2, 1995
Location:     BLDG 3954         Job #:     94013.04
Sq. footage:   City indx:Raleigh, NC
=====

```

SUMMARY

```

=====
Manhours  Matl  Labor  Equipment  Sub  Total
=====
U00              0    $8,802    $1,085        $41      $0    $9,928
U16 ELECTRICAL  44    $2,008    $1,182        $0      $0    $3,190
TOTAL          44   $10,810    $2,267        $41      $0   $13,118

SALES TAX        5.00%    $541
MATL MARKUP      0.00%      $0
LABOR MARKUP     0.00%
EQUIPT MARKUP    0.00%
SUB MARKUP       0.00%

TOTAL BEFORE CONTINGENC  $11,351    $2,267        $41      $0   $13,659
CONTINGENCY        5.00%
BOND               5.00%
PROFIT            10.00%

JOB TOTAL                                     $16,390

```

LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 3962

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) LCCID FY95 (92)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 3962 SKY LIGHTS & LIGHTING PRODUCTS @ HANGARS

FISCAL YEAR 95 DISCRETE PORTION NAME: LIGHTING

ANALYSIS DATE: 02-03-95 ECONOMIC LIFE 10 YEARS PREPARED BY: JAH

1. INVESTMENT

A. CONSTRUCTION COST	\$	47814.		
B. SIOH	\$	2391.		
C. DESIGN COST	\$	2391.		
D. TOTAL COST (1A+1B+1C)	\$	52595.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$		0.	
F. PUBLIC UTILITY COMPANY REBATE	\$		0.	
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$			52595.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1993

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	231.	\$ 8090.	8.77	\$ 70949.
B. DIST	\$.00	0.	\$ 0.	9.26	\$ 0.
C. RESID	\$.00	0.	\$ 0.	10.08	\$ 0.
D. NAT G	\$.00	0.	\$ 0.	10.39	\$ 0.
E. COAL	\$.00	0.	\$ 0.	9.39	\$ 0.
F. LPG	\$.00	0.	\$ 0.	8.78	\$ 0.
M. DEMAND SAVINGS			\$ 6480.	8.49	\$ 55015.
N. TOTAL		231.	\$ 14570.		\$ 125964.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$ 7458.
(1) DISCOUNT FACTOR (TABLE A)	8.49	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$ 63318.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-)(4)
------	------------------------------	-----------------	------------------------	---

d. TOTAL	\$ 0.			0.
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C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-)(3A2+3Bd4)	\$ 63318.
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4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$	\$ 22028.
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5. SIMPLE PAYBACK PERIOD (1G/4)	2.39 YEARS
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6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C)	\$ 189282.
--	------------

7. SAVINGS TO INVESTMENT RATIO (SIR)=(6 / 1G)=	3.60
(IF < 1 PROJECT DOES NOT QUALIFY)	

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR):	17.19 %
---	---------

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
16 DECEMBER 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 3962 - HANGAR

AREA USE: _____
HOURS/DAY: 12
DAYS/WEEK: 5

ELECTRIC COSTS:
ENERGY CHARGE: \$0.03495 PER KWH
DEMAND CHARGE: \$9.25 PER KW

EXISTING FIXTURE DATA

2 FOOT 2 LAMP U @ 92 W/FIXT = 0 WATTS

4 FOOT

58 2 LAMP @ 92 W/FIXT = 5,336 WATTS
3 LAMP @ 137 W/FIXT = 0 WATTS
68 4 LAMP @ 184 W/FIXT = 12,512 WATTS

8 FOOT

3 2 LAMP @ 144 W/FIXT = 432 WATTS

REPLACEMENT FIXTURE DATA

2 FOOT 0 2 LAMP U @ 58 W/FIXT = 0 WATTS

4 FOOT

58 2 LAMP @ 58 W/FIXT = 3,364 WATTS
10 3 LAMP @ 87 W/FIXT = 870 WATTS
58 4 LAMP @ 118 W/FIXT = 6,844 WATTS

8 FOOT

3 2 LAMP @ 125 W/FIXT = 375 WATTS

BASELINE ENERGY CONSUMPTION 57,034 KWH/YR ECO ENERGY CONSUMPTION 35,733 KWH/YR

BASELINE DEMAND 18.28 KW ECO DEMAND 11.45 KW

NET ENERGY SAVINGS

21,300 KWH/YR

NET DEMAND SAVINGS \$758 /YR
NET DOLLAR SAVINGS \$1,502 /YR

MAINTENANCE SAVINGS

10 LAMPS @ \$5.00 / 20,000 HOURS * 3,120 HRYR = \$8 / YEAR (4' FLUORESCENT LAMPS)

NET MAINTENANCE SAVINGS \$8 /YEAR

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
16 DECEMBER 1994

INTERIOR LIGHTING: LIGHTING REPLACEMENT

BUILDING #: 3962 - HANGAR	ELECTRIC COSTS:	
AREA USE: _____	ENERGY CHARGE	\$0.03495 PER KWH
HOURS/DAY: 18	DEMAND CHARGE	\$9.25 PER KW
DAYS/WEEK: 7		
PEAK USE: 1 (1-YES, 0-NO)		

EXISTING FIXTURE DATA

42 INCAND @	750 WATTS =	31,500 WATTS
QUARTZ @	WATTS =	0 WATTS
QUARTZ @	WATTS =	0 WATTS
MV @	WATTS =	0 WATTS
MV @	WATTS =	0 WATTS

REPLACEMENT FIXTURE DATA

42 HPS @	300 WATTS =	12,600 WATTS
0 MH @	WATTS =	0 WATTS
0 MH @	WATTS =	0 WATTS
0 HPS @	WATTS =	0 WATTS
0 HPS @	WATTS =	0 WATTS

BASELINE ENERGY CONSUMPTION	206,388 KWH/YR	ECO ENERGY CONSUMPTION	82,555 KWH/YR
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BASELINE DEMAND	31.50 KW	ECO DEMAND	12.60 KW
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NET ENERGY SAVINGS	123,833 KWH/YR	NET DEMAND SAVINGS	\$2,098 /YR
		NET DOLLAR SAVINGS	\$6,426 /YR

MAINTENANCE SAVINGS

42 LAMPS @ \$26.00 / 1,000 HOURS *	6,570 HR/YR =	\$7,174 / YEAR	(INCANDESCENT)
42 LAMPS @ \$38.00 / 24,000 HOURS *	6,570 HR/YR =	\$437 / YEAR	(HIGH PRESSURE SODIUM)
NET MAINTENANCE SAVINGS		\$6,737 / YEAR	

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
16 DECEMBER 1994

INTERIOR LIGHTING: INCANDESCENT LAMP REPLACEMENT

BUILDING #: 3962 - HANGAR	ELECTRIC COSTS:	
AREA USE: _____	ENERGY CHARGE	\$0.03495 PER KWH
HOURS/DAY: 12	DEMAND CHARGE	\$9.25 PER KW
DAYS/WEEK: 5		
PEAK USE: 1 (1-YES, 0-NO)		

EXISTING INCANDESCENTS

LAMPS @ _____	52 W/FIXT = _____	0 WATTS
LAMPS @ _____	60 W/FIXT = _____	0 WATTS
LAMPS @ _____	75 W/FIXT = _____	1,500 WATTS
LAMPS @ _____	90 W/FIXT = _____	0 WATTS
LAMPS @ _____	100 W/FIXT = _____	0 WATTS

COMPACT FLUORESCENT REPLACEMENT

0 LAMPS @ _____	13 W/FIXT = _____	0 WATTS
0 LAMPS @ _____	13 W/FIXT = _____	0 WATTS
20 LAMPS @ _____	18 W/FIXT = _____	360 WATTS
0 LAMPS @ _____	26 W/FIXT = _____	0 WATTS
0 LAMPS @ _____	26 W/FIXT = _____	0 WATTS

BASELINE ENERGY CONSUMPTION	4,680 KWH/YR	ECO ENERGY CONSUMPTION	1,123 KWH/YR
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BASELINE DEMAND	1.50 KW	ECO DEMAND	0.36 KW
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NET ENERGY SAVINGS	3,557 KWH/YR	NET DEMAND SAVINGS	\$127 /YR
		NET DOLLAR SAVINGS	\$251 /YR

MAINTENANCE SAVINGS

20 LAMPS @ \$3.50 / 750 HOURS *	3,120 HR/YR =	\$291 / YEAR	(INCANDESCENT)
20 LAMPS @ \$2.00 / 10,000 HOURS *	3,120 HR/YR =	\$12 / YEAR	(COMPACT FLUORESCENT)

NET MAINTENANCE SAVINGS \$279 /YEAR

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
02 FEBRUARY 1995

CONVENTIONAL SKY LIGHTS IN HANGARS

BUILDING #: 3962 - HANGAR

ELECTRIC COSTS:
ENERGY CHARGE
DEMAND CHARGE

\$0.03495 PER KWH
\$9.25 PER KW

WATTAGE CONTROLLED: 31,500 W
PEAK USE: 1 (1-YES, 0-NO)

CURRENT USAGE:
HOURS/YEAR 6,570

REVISED USAGE:
HOURS/YEAR 3,942

BASELINE ENERGY CONSUMPTION	205,955 KWH/YR	ECO ENERGY CONSUMPTION	124,173 KWH/YR
BASELINE DEMAND	31.5 KW	ECO DEMAND	31.5 KW

NET ENERGY SAVINGS	82,782 KWH/YR	NET DEMAND SAVINGS	\$3,497 /YR
		NET DOLLAR SAVINGS	\$6,390 /YR

MAINTENANCE SAVINGS

42 LAMPS @	\$47.00	/ 20,000 HOURS *	6,570	HR/YR =	\$648 / YEAR	(WITHOUT SKYLIGHTS)
42 LAMPS @	\$38.00	/ 24,000 HOURS *	6,570	HR/YR =	\$437 / YEAR	(WITHOUT SKYLIGHTS)
42 LAMPS @	\$47.00	/ 20,000 HOURS *	3,942	HR/YR =	\$389 / YEAR	(WITH SKYLIGHTS)
42 LAMPS @	\$38.00	/ 24,000 HOURS *	3,942	HR/YR =	\$262 / YEAR	(WITH SKYLIGHTS)

NET MAINTENANCE SAVINGS \$434 /YEAR

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Estimate:      LIGHTING UPGRADE   Date:      FEBRUARY 2, 1995
Description:   LIGHTING PRODUCT UPGRADE
Project:       HANGAR LIGHTING   Bid Date:  FEBRUARY 2, 1995
Location:      BLDG 3962         Job #:     94013.04
Sq. footage:   City indx:Raleigh, NC
=====

```

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0002000000	DEMOLITION, 2X4 FLUORESCENT FIXTURES					10.00	FIXTURE
Unit values	0.49	0.00	13.35	0.00	0.00		13.35
Totals	4.90	\$0	\$134	\$0	\$0		\$134
0002010000	DEMOLITION, INCANDESCENT FIXTURES/EXIT SIGNS					20.00	FIXTURE
Unit values	0.26	0.00	7.10	0.00	0.00		7.10
Totals	5.20	\$0	\$142	\$0	\$0		\$142
0002020000	DEMOLITION, 1X4 FLUORESCENT FIXTURES					119.00	FIXTURE
Unit values	0.49	0.00	13.35	0.00	0.00		13.35
Totals	58.31	\$0	\$1,589	\$0	\$0		\$1,589
0002030000	DEMOLITION, HIGH BAY FIXTURES					42.00	FIXTURE
Unit values	1.00	0.00	27.50	0.00	0.00		27.50
Totals	42.00	\$0	\$1,155	\$0	\$0		\$1,155
0010400000	1X4 2-32 WATT FLUORESCENT LAMPS, PENDANT MOUNTED					58.00	FIXTURE
Unit values	1.14	39.00	31.50	0.00	0.00		70.50
Totals	66.12	\$2,262	\$1,827	\$0	\$0		\$4,089
0010600000	1X8 2-59 WATT FLUORESCENT LAMPS, PENDANT MOUNTED					3.00	FIXTURE
Unit values	1.75	131.00	48.12	0.00	0.00		179.12
Totals	5.25	\$393	\$144	\$0	\$0		\$537
0011200000	18 WATT COMPACT FLUORESCENT FIXTURE GLOBE ASSEMBLY					20.00	FIXTURE
Unit values	0.13	25.50	3.44	0.00	0.00		28.94
Totals	2.60	\$510	\$69	\$0	\$0		\$579
0011300000	250 WATT HIGH PRESSURE SODIUM FIXTURE WITH COLOR CORRECTION					42.00	FIXTURE
Unit values	2.00	214.00	55.00	0.00	0.00		269.00
Totals	84.00	\$8,988	\$2,310	\$0	\$0		\$11,298
0011400000	2X4 3-32 WATT FLUORESCENT LAMPS, SURFACE MOUNTED WITH REFLECTOR					10.00	FIXTURE

02-Feb-95

MeansData for Lotus

Page 2

Unit values	1.51	79.00	41.50	0.00	0.00	120.50
Totals	15.10	\$790	\$415	\$0	\$0	\$1,205

0011500000 1X4 4-32 WATT FLUORESCENT LAMPS, PENDANT

MOUNTED

58.00 FIXTURE

Unit values	1.14	49.00	31.50	0.00	0.00	80.50
Totals	66.12	\$2,842	\$1,827	\$0	\$0	\$4,669

```
=====
Line #      Description
-----
      Manhours  Matl    Labor  Equipment  Sub    Total
=====
U00          350   $15,785   $9,612         $0      $0   $25,397

ESTIMATE TOTAL      350   $15,785   $9,612         $0      $0   $25,397

SALES TAX           5.00%      $789
MATL MARKUP         0.00%      $0
LABOR MARKUP        0.00%      $0
EQUIPT MARKUP       0.00%      $0
SUB MARKUP          0.00%      $0

TOTAL BEFORE CONTINGENC  $16,574   $9,612         $0      $0   $26,186
CONTINGENCY          5.00%      $1,309
BOND                 5.00%      $1,309
PROFIT              10.00%      $2,619

JOB TOTAL                                     $31,424
```

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=====
Estimate:      LIGHTING UPGRADE   Date:      FEBRUARY 2, 1995
Description:   LIGHTING PRODUCT UPGRADE
Project:       HANGAR LIGHTING   Bid Date:  FEBRUARY 2, 1995
Location:     BLDG 3962         Job #:     94013.04
Sq. footage:   City indx:Raleigh, NC
=====

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SUMMARY

```

=====
Manhours  Matl  Labor  Equipment  Sub  Total
=====
U00              350  $15,785  $9,612      $0      $0  $25,397
TOTAL              350  $15,785  $9,612      $0      $0  $25,397

SALES TAX          5.00%      $789
MATL MARKUP        0.00%      $0
LABOR MARKUP       0.00%      $0
EQUIPT MARKUP      0.00%      $0
SUB MARKUP         0.00%      $0

TOTAL BEFORE CONTINGENC  $16,574  $9,612  $0      $0  $26,186
CONTINGENCY          5.00%      $1,309
BOND                 5.00%      $1,309
PROFIT              10.00%      $2,619

JOB TOTAL                                $31,424

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=====
Estimate:      BLDG 3962      Date:      FEBRUARY 2, 1995
Description:   CONVENTIONAL SKYLIGHT & CONTROLS
Project:      HANGAR STUDY   Bid Date: FEBRUARY 2, 1995
Location:     BLDG 3962     Job #:    94013.04
Sq. footage:   City indx:Raleigh, NC
=====

```

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0060000001	CONVENTIONAL SKYLIGHT WITH 4" INSULATED CURBS (DOUBLE PANED)						
						450.00 SQ. FT	
Unit values		0.00	19.56	2.41	0.09	0.00	22.06
Totals		0.00	\$8,802	\$1,085	\$41	\$0	\$9,928
U00		0	\$8,802	\$1,085	\$41	\$0	\$9,928

Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1611350023	LOW VOLTAGE WIRE #18-4C					
Unit values	1.23	15.40	34.00	0.00	10.00 CLF	49.40
Totals	12.30	\$154	\$340	\$0	\$0	\$494
1611750101	LIGHTING CONTACTOR					
Unit values	2.00	137.00	55.00	0.00	3.00 EA.	192.00
Totals	6.00	\$411	\$165	\$0	\$0	\$576
1611850101	PHOTO SWITCH 50-500 FC ADJUSTABLE					
Unit values	1.00	290.00	27.50	0.00	4.00 EA.	317.50
Totals	4.00	\$1,160	\$110	\$0	\$0	\$1,270
1611870101	LOW VOLTAGE TRANS 115V-24V					
Unit values	0.67	64.00	18.35	0.00	1.00 EA.	82.35
Totals	0.67	\$64	\$18	\$0	\$0	\$82
1611870102	SWITCHING RELAYS					
Unit values	0.50	11.30	13.75	0.00	8.00 EA.	25.05
Totals	4.00	\$90	\$110	\$0	\$0	\$200
1611950101	1/2" EMT					
Unit values	0.05	0.38	1.29	0.00	340.00 LF	1.67
Totals	17.00	\$129	\$439	\$0	\$0	\$568
U16 ELECTRICAL	44	\$2,008	\$1,182	\$0	\$0	\$3,190

```
=====
Line #      Description
-----
      Manhours   Matl     Labor   Equipment   Sub     Total
=====
```

ESTIMATE TOTAL	44	\$10,810	\$2,267	\$41	\$0	\$13,118
SALES TAX	5.00%	\$541				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$11,351	\$2,267	\$41	\$0	\$13,659
CONTINGENCY	5.00%					\$683
BOND	5.00%					\$683
PROFIT	10.00%					\$1,366
JOB TOTAL						\$16,390

```

=====
Estimate:      BLDG 3962      Date:      FEBRUARY 2, 1995
Description:   CONVENTIONAL SKYLIGHT & CONTROLS
Project:      HANGAR STUDY   Bid Date: FEBRUARY 2, 1995
Location:     BLDG 3962     Job #:    94013.04
Sq. footage:  City indx:Raleigh, NC
=====

```

SUMMARY

```

=====
Manhours  Matl  Labor  Equipment  Sub  Total
=====
U00              0    $8,802    $1,085        $41        $0    $9,928
U16 ELECTRICAL  44    $2,008    $1,182        $0        $0    $3,190
TOTAL          44   $10,810    $2,267        $41        $0   $13,118

SALES TAX      5.00%    $541
MATL MARKUP    0.00%      $0
LABOR MARKUP   0.00%      $0
EQUIPT MARKUP  0.00%      $0
SUB MARKUP     0.00%      $0

TOTAL BEFORE CONTINGENC  $11,351    $2,267        $41        $0   $13,659
CONTINGENCY      5.00%      $683
BOND             5.00%      $683
PROFIT          10.00%     $1,366

JOB TOTAL                                     $16,390

```

LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 4137

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) LCCID FY95 (92)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 4137 SKY LIGHTS & LIGHTING PRODUCTS @ HANGARS

FISCAL YEAR 95 DISCRETE PORTION NAME: LIGHTING

ANALYSIS DATE: 02-03-95 ECONOMIC LIFE 10 YEARS PREPARED BY: JAH

1. INVESTMENT

A. CONSTRUCTION COST	\$	37287.		
B. SIOH	\$	1864.		
C. DESIGN COST	\$	1864.		
D. TOTAL COST (1A+1B+1C)	\$	41016.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$		0.	
F. PUBLIC UTILITY COMPANY REBATE	\$		0.	
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$			41016.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1993

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	149.	\$ 5213.	8.77	\$ 45718.
B. DIST	\$.00	0.	\$ 0.	9.26	\$ 0.
C. RESID	\$.00	0.	\$ 0.	10.08	\$ 0.
D. NAT G	\$.00	0.	\$ 0.	10.39	\$ 0.
E. COAL	\$.00	0.	\$ 0.	9.39	\$ 0.
F. LPG	\$.00	0.	\$ 0.	8.78	\$ 0.
M. DEMAND SAVINGS			\$ 6266.	8.49	\$ 53198.
N. TOTAL		149.	\$ 11479.		\$ 98916.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$	619.
(1) DISCOUNT FACTOR (TABLE A)		8.49	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$	5255.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-) (4)
d. TOTAL	\$	0.		0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-) (3A2+3Bd4) \$ 5255.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ 12098.

5. SIMPLE PAYBACK PERIOD (1G/4) 3.39 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 104171.

7. SAVINGS TO INVESTMENT RATIO (SIR)=(6 / 1G)= 2.54
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 13.17 %

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
16 DECEMBER 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 4137 - HANGAR

AREA USE: _____
HOURS/DAY 12
DAYS/WEEK 5

ELECTRIC COSTS:
ENERGY CHARGE \$0.03495 PER KWH
DEMAND CHARGE \$9.25 PER KW

EXISTING FIXTURE DATA

2 FOOT 2 LAMP U @ 92 W/FIXT = 0 WATTS
4 FOOT 66 2 LAMP @ 92 W/FIXT = 6,072 WATTS
137 W/FIXT = 0 WATTS
184 W/FIXT = 0 WATTS
8 FOOT 6 2 LAMP @ 144 W/FIXT = 864 WATTS

REPLACEMENT FIXTURE DATA

2 FOOT 0 2 LAMP U @ 58 W/FIXT = 0 WATTS
4 FOOT 66 2 LAMP @ 58 W/FIXT = 3,828 WATTS
87 W/FIXT = 0 WATTS
118 W/FIXT = 0 WATTS
8 FOOT 6 2 LAMP @ 125 W/FIXT = 750 WATTS

BASELINE ENERGY CONSUMPTION 21,840 KWH/YR ECO ENERGY CONSUMPTION 14,283 KWH/YR
BASELINE DEMAND 6.94 KW ECO DEMAND 4.58 KW

NET ENERGY SAVINGS 7,357 KWH/YR

NET DEMAND SAVINGS \$262 /YR
NET DOLLAR SAVINGS \$519 /YR

MAINTENANCE SAVINGS

LAMPS @ \$5.00 / 20,000 HOURS * HR/YR = \$0 / YEAR (4' FLUORESCENT LAMPS)
NET MAINTENANCE SAVINGS \$0 /YEAR

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
16 DECEMBER 1994

INTERIOR LIGHTING: LIGHTING REPLACEMENT

BUILDING #: 4137 - HANGAR	ELECTRIC COSTS:	
AREA USE:	ENERGY CHARGE	\$0.03495 PER KWH
HOURS/DAY: 12	DEMAND CHARGE	\$9.25 PER KW
DAYS/WEEK: 5		
PEAK USE: 1 (1-YES, 0-NO)		

EXISTING FIXTURE DATA		REPLACEMENT FIXTURE DATA	
INCAND @	WATTS = 0 WATTS	0 MH @	WATTS = 0 WATTS
QUARTZ @	WATTS = 0 WATTS	0 MH @	WATTS = 0 WATTS
QUARTZ @	WATTS = 0 WATTS	0 MH @	WATTS = 0 WATTS
48 MV @	1075 WATTS = 51,600 WATTS	48 MH @	WATTS = 21,600 WATTS
MV @	WATTS = 0 WATTS	0 HPS @	WATTS = 0 WATTS
BASELINE ENERGY CONSUMPTION		ECO ENERGY CONSUMPTION	
160,992 KWH/YR		67,392 KWH/YR	
BASELINE DEMAND		ECO DEMAND	
51.60 KW		21.60 KW	

NET ENERGY SAVINGS	93,600 KWH/YR	NET DEMAND SAVINGS	\$3,330 /YR
		NET DOLLAR SAVINGS	\$6,601 /YR

MAINTENANCE SAVINGS

48 LAMPS @ \$70.00 / 24,000 HOURS *	3,120 HR/YR =	\$437 / YEAR	(MERCURY VAPOR)
48 LAMPS @ \$47.00 / 20,000 HOURS *	3,120 HR/YR =	\$352 / YEAR	(METAL HALIDE)
NET MAINTENANCE SAVINGS		\$85 /YEAR	

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
16 DECEMBER 1994

INTERIOR LIGHTING: INCANDESCENT LAMP REPLACEMENT

BUILDING #: 4137 - HANGAR	ELECTRIC COSTS:	
AREA USE: _____	ENERGY CHARGE	\$0.03495 PER KWH
HOURS/DAY: 12	DEMAND CHARGE	\$9.25 PER KW
DAYS/WEEK: 5		
PEAK USE: 1 (1-YES, 0-NO)		

EXISTING INCANDESCENTS

LAMPS @	52	W/FIXT =	0	WATTS
2 LAMPS @	60	W/FIXT =	120	WATTS
LAMPS @	75	W/FIXT =	0	WATTS
LAMPS @	90	W/FIXT =	0	WATTS
14 LAMPS @	200	W/FIXT =	2,800	WATTS

COMPACT FLUORESCENT REPLACEMENT

0 LAMPS @	13	W/FIXT =	0	WATTS
2 LAMPS @	13	W/FIXT =	26	WATTS
0 LAMPS @	18	W/FIXT =	0	WATTS
0 LAMPS @	26	W/FIXT =	0	WATTS
7 2 LAMP @	58	W/FIXT =	406	WATTS

(FOUR FOOT FLUORESCENT FIXTURE)

BASELINE ENERGY CONSUMPTION	9,110 KWH/YR	ECO ENERGY CONSUMPTION	1,348 KWH/YR
BASELINE DEMAND	2.92 KW	ECO DEMAND	0.43 KW

NET ENERGY SAVINGS	7,763 KWH/YR	NET DEMAND SAVINGS	\$276 /YR
		NET DOLLAR SAVINGS	\$547 /YR

MAINTENANCE SAVINGS

2 LAMPS @	\$3.50	/ 750 HOURS *	3,120	HR/YR =	\$29 / YEAR	(INCANDESCENT)
14 LAMPS @	\$5.25	/ 750 HOURS *	3,120	HR/YR =	\$306 / YEAR	(INCANDESCENT)
2 LAMPS @	\$2.00	/ 10,000 HOURS *	3,120	HR/YR =	\$1 / YEAR	(COMPACT FLUORESCENT)
14 LAMPS @	\$5.00	/ 20,000 HOURS *	3,120	HR/YR =	\$11 / YEAR	(4' FLUORESCENT LAMPS)

NET MAINTENANCE SAVINGS \$323 /YEAR

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
02 FEBRUARY 1995

CONVENTIONAL SKY LIGHTS IN HANGARS

BUILDING #: 4137 - HANGAR

ELECTRIC COSTS:
ENERGY CHARGE \$0.03495 PER KWH
DEMAND CHARGE \$9.25 PER KW

WATTAGE CONTROLLED: 21,600 W
PEAK USE: 1 (1-YES, 0-NO)

CURRENT USAGE:
HOURS/YEAR 3,120

REVISED USAGE:
HOURS/YEAR 1,248

BASELINE ENERGY CONSUMPTION	67,392 KWH/YR	ECO ENERGY CONSUMPTION	26,957 KWH/YR
BASELINE DEMAND	21.6 KW	ECO DEMAND	21.6 KW

NET ENERGY SAVINGS	40,435 KWH/YR	NET DEMAND SAVINGS	\$2,398 /YR
		NET DOLLAR SAVINGS	\$3,811 /YR

MAINTENANCE SAVINGS

48 LAMPS @ \$47.00 / 20,000 HOURS *	3,120 HRYR =	\$352 / YEAR	(WITHOUT SKYLIGHTS)
48 LAMPS @ \$47.00 / 20,000 HOURS *	1,248 HRYR =	\$141 / YEAR	(WITH SKYLIGHTS)

NET MAINTENANCE SAVINGS \$211 /YEAR

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Estimate:      LIGHTING UPGRADE   Date:      FEBRUARY 2, 1995
Description:   LIGHTING PRODUCT UPGRADE
Project:       HANGAR LIGHTING   Bid Date:  FEBRUARY 2, 1995
Location:      BLDG 4137         Job #:     94013.04
Sq. footage:   City indx:Raleigh, NC
=====

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Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0002010000	DEMOLITION, INCANDESCENT FIXTURES/EXIT SIGNS					16.00	FIXTURE
Unit values	0.26	0.00	7.10	0.00	0.00	7.10	
Totals	4.16	\$0	\$114	\$0	\$0	\$114	
0002020000	DEMOLITION, 1X4 FLUORESCENT FIXTURES					72.00	FIXTURE
Unit values	0.49	0.00	13.35	0.00	0.00	13.35	
Totals	35.28	\$0	\$961	\$0	\$0	\$961	
0002030000	DEMOLITION, HIGH BAY FIXTURES					48.00	FIXTURE
Unit values	1.00	0.00	27.50	0.00	0.00	27.50	
Totals	48.00	\$0	\$1,320	\$0	\$0	\$1,320	
0010000000	1X4 2-32 WATT FLUORESCENT LAMPS, SURFACE MOUNTED					7.00	FIXTURE
Unit values	1.14	60.00	31.50	0.00	0.00	91.50	
Totals	7.98	\$420	\$221	\$0	\$0	\$641	
0010400000	1X4 2-32 WATT FLUORESCENT LAMPS, PENDANT MOUNTED					66.00	FIXTURE
Unit values	1.14	39.00	31.50	0.00	0.00	70.50	
Totals	75.24	\$2,574	\$2,079	\$0	\$0	\$4,653	
0010600000	1X8 2-59 WATT FLUORESCENT LAMPS, PENDANT MOUNTED					6.00	FIXTURE
Unit values	1.75	131.00	48.12	0.00	0.00	179.12	
Totals	10.50	\$786	\$289	\$0	\$0	\$1,075	
0011000000	400 WATT METAL HALIDE FIXTURE					48.00	FIXTURE
Unit values	2.00	207.00	55.00	0.00	0.00	262.00	
Totals	96.00	\$9,936	\$2,640	\$0	\$0	\$12,576	
0011100000	13 WATT COMPACT FLUORESCENT FIXTURE GLOBE ASSEMBLY					2.00	FIXTURE
Unit values	0.13	25.50	3.44	0.00	0.00	28.94	
Totals	0.26	\$51	\$7	\$0	\$0	\$58	

03-Feb-95

MeansData for Lotus

Page 2

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=====
Line #      Description
-----
      Manhours   Matl    Labor   Equipment   Sub    Total
=====
U00          278    $13,767    $7,631         $0        $0    $21,398

ESTIMATE TOTAL      278    $13,767    $7,631         $0        $0    $21,398

SALES TAX          5.00%        $688
MATL MARKUP        0.00%         $0
LABOR MARKUP       0.00%         $0
EQUIPT MARKUP     0.00%         $0
SUB MARKUP        0.00%         $0

TOTAL BEFORE CONTINGENC $14,455    $7,631         $0        $0    $22,086
CONTINGENCY          5.00%         $1,104
BOND                 5.00%         $1,104
PROFIT              10.00%         $2,209

JOB TOTAL                                $26,504
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Estimate:      LIGHTING UPGRADE   Date:      FEBRUARY 2, 1995
Description:   LIGHTING PRODUCT UPGRADE
Project:       HANGAR LIGHTING   Bid Date:  FEBRUARY 2, 1995
Location:     BLDG 4137         Job #:     94013.04
Sq. footage:   City indx:Raleigh, NC
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SUMMARY

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=====
Manhours      Matl      Labor      Equipment      Sub      Total
=====
U00            278      $13,767      $7,631          $0          $0      $21,398
TOTAL          278      $13,767      $7,631          $0          $0      $21,398

SALES TAX      5.00%      $688
MATL MARKUP    0.00%      $0
LABOR MARKUP   0.00%      $0
EQUIPT MARKUP  0.00%      $0
SUB MARKUP     0.00%      $0

TOTAL BEFORE CONTINGENC $14,455      $7,631          $0          $0      $22,086
CONTINGENCY      5.00%      $1,104
BOND             5.00%      $1,104
PROFIT          10.00%      $2,209

JOB TOTAL                                $26,504

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=====
Estimate:      BLDG 4137          Date:      FEBRUARY 2, 1995
Description:    CONVENTIONAL SKYLIGHT & CONTROLS
Project:        HANGAR STUDY      Bid Date:   FEBRUARY 2, 1995
Location:       BLDG 4137        Job #:     94013.04
Sq. footage:    City indx:Raleigh, NC
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Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0060000001	CONVENTIONAL SKYLIGHT WITH 4" INSULATED CURBS (DOUBLE PANED)					300.00 SQ. FT	
Unit values		0.00	19.56	2.41	0.09	0.00	22.06
Totals		0.00	\$5,868	\$723	\$27	\$0	\$6,618
U00		0	\$5,868	\$723	\$27	\$0	\$6,618

=====						
Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1611350023	LOW VOLTAGE WIRE #18-4C					
Unit values	1.23	15.40	34.00	0.00	5.00 CLF	
Totals	6.15	\$77	\$170	\$0	0.00	49.40
					\$0	\$247
1611750101	LIGHTING CONTACTOR					
Unit values	2.00	137.00	55.00	0.00	2.00 EA.	
Totals	4.00	\$274	\$110	\$0	0.00	192.00
					\$0	\$384
1611850101	PHOTO SWITCH 50-500 FC ADJUSTABLE					
Unit values	1.00	290.00	27.50	0.00	2.00 EA.	
Totals	2.00	\$580	\$55	\$0	0.00	317.50
					\$0	\$635
1611870101	LOW VOLTAGE TRANS 115V-24V					
Unit values	0.67	64.00	18.35	0.00	1.00 EA.	
Totals	0.67	\$64	\$18	\$0	0.00	82.35
					\$0	\$82
1611870102	SWITCHING RELAYS					
Unit values	0.50	11.30	13.75	0.00	4.00 EA.	
Totals	2.00	\$45	\$55	\$0	0.00	25.05
					\$0	\$100
1611950101	1/2" EMT					
Unit values	0.05	0.38	1.29	0.00	340.00 LF	
Totals	17.00	\$129	\$439	\$0	0.00	1.67
					\$0	\$568
U16 ELECTRICAL	32	\$1,169	\$847	\$0	\$0	\$2,016

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=====
Line #      Description
-----
      Manhours   Matl    Labor   Equipment   Sub    Total
=====
```

ESTIMATE TOTAL	32	\$7,037	\$1,570	\$27	\$0	\$8,634
SALES TAX	5.00%	\$352				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$7,389	\$1,570	\$27	\$0	\$8,986
CONTINGENCY	5.00%					\$449
BOND	5.00%					\$449
PROFIT	10.00%					\$899
JOB TOTAL						\$10,783

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Estimate:      BLDG 4137           Date:      FEBRUARY 2, 1995
Description:   CONVENTIONAL SKYLIGHT & CONTROLS
Project:       HANGAR STUDY       Bid Date:  FEBRUARY 2, 1995
Location:     BLDG 4137           Job #:      94013.04
Sq. footage:   City indx:Raleigh, NC
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SUMMARY

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              Manhours   Matl      Labor    Equipment    Sub      Total
=====
U00              0      $5,868      $723          $27          $0      $6,618
U16 ELECTRICAL   32      $1,169      $847          $0          $0      $2,016
TOTAL            32      $7,037      $1,570        $27          $0      $8,634

SALES TAX        5.00%      $352
MATL MARKUP      0.00%        $0
LABOR MARKUP     0.00%          $0
EQUIPT MARKUP    0.00%          $0
SUB MARKUP       0.00%          $0

TOTAL BEFORE CONTINGENC $7,389      $1,570        $27          $0      $8,986
CONTINGENCY       5.00%          $449
BOND              5.00%          $449
PROFIT            10.00%          $899

JOB TOTAL                                     $10,783

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LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 4242

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) LCCID FY95 (92)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 4242 SKY LIGHTS & LIGHTING PRODUCTS @ HANGARS

FISCAL YEAR 95 DISCRETE PORTION NAME: LIGHTING

ANALYSIS DATE: 02-03-95 ECONOMIC LIFE 10 YEARS PREPARED BY: JAH

1. INVESTMENT

A. CONSTRUCTION COST	\$	19722.		
B. SIOH	\$	986.		
C. DESIGN COST	\$	986.		
D. TOTAL COST (1A+1B+1C)	\$	21694.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.		
F. PUBLIC UTILITY COMPANY REBATE	\$	0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$		21694.	

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1993

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	42.	\$ 1476.	8.77	\$ 12946.
B. DIST	\$.00	0.	\$ 0.	9.26	\$ 0.
C. RESID	\$.00	0.	\$ 0.	10.08	\$ 0.
D. NAT G	\$.00	0.	\$ 0.	10.39	\$ 0.
E. COAL	\$.00	0.	\$ 0.	9.39	\$ 0.
F. LPG	\$.00	0.	\$ 0.	8.78	\$ 0.
M. DEMAND SAVINGS			\$ 2283.	8.49	\$ 19383.
N. TOTAL		42.	\$ 3759.		\$ 32329.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$	1581.
(1) DISCOUNT FACTOR (TABLE A)	8.49		
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$	13423.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-)(4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-)(3A2+3Bd4)\$ 13423.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ 5340.

5. SIMPLE PAYBACK PERIOD (1G/4) 4.06 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 45751.

7. SAVINGS TO INVESTMENT RATIO (SIR)=(6 / 1G)= 2.11
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 11.09 %

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
16 DECEMBER 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 4242 - HANGAR	ELECTRIC COSTS:	\$0.03495	PER KWH
AREA USE: _____	ENERGY CHARGE	\$9.25	PER KW
HOURS/DAY: 10	DEMAND CHARGE		
DAYS/WEEK: 5			

EXISTING FIXTURE DATA		REPLACEMENT FIXTURE DATA	
2 FOOT	2 LAMP U @ 92 W/FIXT = 0 WATTS	2 FOOT	0 2 LAMP U @ 58 W/FIXT = 0 WATTS
4 FOOT	2 LAMP @ 92 W/FIXT = 0 WATTS	4 FOOT	3 2 LAMP @ 58 W/FIXT = 174 WATTS
	3 3 LAMP @ 137 W/FIXT = 411 WATTS		24 3 LAMP @ 87 W/FIXT = 2,088 WATTS
	24 4 LAMP @ 184 W/FIXT = 4,416 WATTS		0 4 LAMP @ 118 W/FIXT = 0 WATTS
8 FOOT	2 LAMP @ 144 W/FIXT = 0 WATTS	8 FOOT	0 2 LAMP @ 125 W/FIXT = 0 WATTS
BASELINE ENERGY CONSUMPTION		ECO ENERGY CONSUMPTION	
12,550 KWH/YR		5,881 KWH/YR	
BASELINE DEMAND		ECO DEMAND	
4.83 KW		2.26 KW	

NET ENERGY SAVINGS	6,669 KWH/YR
NET DEMAND SAVINGS	\$285 /YR
NET DOLLAR SAVINGS	\$518 /YR

MAINTENANCE SAVINGS

27 LAMPS @ \$5.00 / 20,000 HOURS *	2,600 HR/YR =	\$18 / YEAR	(4' FLUORESCENT LAMPS)
NET MAINTENANCE SAVINGS		\$18 /YEAR	

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
16 DECEMBER 1994

INTERIOR LIGHTING: LIGHTING REPLACEMENT

BUILDING #: 4242 - HANGAR

AREA USE: _____
HOURS/DAY: 10
DAYS/WEEK: 5
PEAK USE: 1 (1-YES, 0-NO)

ELECTRIC COSTS:
ENERGY CHARGE \$0.03495 PER KWH
DEMAND CHARGE \$9.25 PER KW

EXISTING FIXTURE DATA

24 INCAND @ 750 WATTS = 18,000 WATTS
QUARTZ @ _____ WATTS = 0 WATTS
QUARTZ @ _____ WATTS = 0 WATTS
MV @ _____ WATTS = 0 WATTS
MV @ _____ WATTS = 0 WATTS

REPLACEMENT FIXTURE DATA

24 MH @ 450 WATTS = 10,800 WATTS
0 MH @ _____ WATTS = 0 WATTS
0 MH @ _____ WATTS = 0 WATTS
0 MH @ _____ WATTS = 0 WATTS
0 HPS @ _____ WATTS = 0 WATTS

BASELINE ENERGY CONSUMPTION 46,800 KWH/YR

28,080 KWH/YR

BASELINE DEMAND 18.00 KW

ECO DEMAND 10.80 KW

NET ENERGY SAVINGS 18,720 KWH/YR

NET DEMAND SAVINGS

\$799 /YR

NET DOLLAR SAVINGS \$1,453 /YR

MAINTENANCE SAVINGS

24 LAMPS @ \$26.00 / 1,000 HOURS *
24 LAMPS @ \$47.00 / 20,000 HOURS *

2,600 HR/YR = \$1,622 / YEAR (INCANDSCENT)
2,600 HR/YR = \$147 / YEAR (METAL HALIDE)

NET MAINTENANCE SAVINGS

\$1,475 /YEAR

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
02 FEBRUARY 1995

CONVENTIONAL SKY LIGHTS IN HANGARS

BUILDING #: 4242 - HANGAR

ELECTRIC COSTS:
ENERGY CHARGE
DEMAND CHARGE

\$0.03495 PER KWH
\$9.25 PER KW

WATTAGE CONTROLLED: 10,800 W

PEAK USE: 1 (1-YES, 0-NO)

CURRENT USAGE:
HOURS/YEAR

2,600

REVISED USAGE:
HOURS/YEAR

1,040

BASELINE ENERGY CONSUMPTION

28,080 KWH/YR

ECO ENERGY CONSUMPTION

11,232 KWH/YR

BASELINE DEMAND

10.8 KW

ECO DEMAND

10.8 KW

NET ENERGY SAVINGS

16,848 KWH/YR

NET DEMAND SAVINGS

\$1,199 /YR

NET DOLLAR SAVINGS

\$1,788 /YR

MAINTENANCE SAVINGS

24 LAMPS @ \$47.00 / 20,000 HOURS *
24 LAMPS @ \$47.00 / 20,000 HOURS *

2,600 HR/YR = \$147 / YEAR
1,040 HR/YR = \$59 / YEAR

(WITHOUT SKYLIGHTS)
(WITH SKYLIGHTS)

NET MAINTENANCE SAVINGS

\$88 /YEAR


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Estimate:      LIGHTING UPGRADE   Date:      FEBRUARY 2, 1995
Description:   LIGHTING PRODUCT UPGRADE
Project:       HANGAR LIGHTING   Bid Date:  FEBRUARY 2, 1995
Location:     BLDG 4242         Job #:     94013.04
Sq. footage:   City indx:Raleigh, NC
=====

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Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0002000000	DEMOLITION, 2X4 FLUORESCENT FIXTURES					27.00	FIXTURE
Unit values	0.49	0.00	13.35	0.00	0.00	13.35	
Totals	13.23	\$0	\$360	\$0	\$0	\$360	
0002030000	DEMOLITION, HIGH BAY FIXTURES					24.00	FIXTURE
Unit values	1.00	0.00	27.50	0.00	0.00	27.50	
Totals	24.00	\$0	\$660	\$0	\$0	\$660	
0010500000	2X4 2-32 WATT FLUORESCENT LAMPS, RECESSED MOUNTED WITH REFLECTORS					3.00	FIXTURE
Unit values	1.51	75.00	41.50	0.00	0.00	116.50	
Totals	4.53	\$225	\$125	\$0	\$0	\$350	
0011000000	400 WATT METAL HALIDE FIXTURE					24.00	FIXTURE
Unit values	2.00	207.00	55.00	0.00	0.00	262.00	
Totals	48.00	\$4,968	\$1,320	\$0	\$0	\$6,288	
0011400000	2X4 3-32 WATT FLUORESCENT LAMPS, SURFACE MOUNTED WITH REFLECTOR					24.00	FIXTURE
Unit values	1.51	79.00	41.50	0.00	0.00	120.50	
Totals	36.24	\$1,896	\$996	\$0	\$0	\$2,892	
U00		126	\$7,089	\$3,461	\$0	\$0	\$10,550

```
=====
Line #      Description
-----
      Manhours   Matl     Labor   Equipment   Sub     Total
=====
```

ESTIMATE TOTAL	126	\$7,089	\$3,461	\$0	\$0	\$10,550
SALES TAX	5.00%	\$354				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$7,443	\$3,461	\$0	\$0	\$10,904
CONTINGENCY	5.00%					\$545
BOND	5.00%					\$545
PROFIT	10.00%					\$1,090
JOB TOTAL						\$13,085

```

=====
Estimate:    LIGHTING UPGRADE   Date:    FEBRUARY 2, 1995
Description: LIGHTING PRODUCT UPGRADE
Project:     HANGAR LIGHTING   Bid Date: FEBRUARY 2, 1995
Location:    BLDG 4242         Job #:    94013.04
Sq. footage:                      City indx:Raleigh, NC
=====

```

SUMMARY

```

=====
Manhours    Matl    Labor    Equipment    Sub    Total
=====
U00          126    $7,089    $3,461          $0      $0    $10,550
TOTAL        126    $7,089    $3,461          $0      $0    $10,550

SALES TAX      5.00%    $354
MATL MARKUP    0.00%      $0
LABOR MARKUP   0.00%          $0
EQUIPT MARKUP  0.00%          $0
SUB MARKUP     0.00%          $0

TOTAL BEFORE CONTINGENC $7,443    $3,461          $0      $0    $10,904
CONTINGENCY      5.00%          $545
BOND              5.00%          $545
PROFIT           10.00%         $1,090
JOB TOTAL                                $13,085

```

```

=====
Estimate:      BLDG 4242          Date:      FEBRUARY 2, 1995
Description:   CONVENTIONAL SKYLIGHT & CONTROLS
Project:       HANGAR STUDY      Bid Date:  FEBRUARY 2, 1995
Location:     BLDG 4242         Job #:      94013.04
Sq. footage:   City indx:Raleigh, NC
=====

```

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0060000001	CONVENTIONAL SKYLIGHT WITH 4" INSULATED CURBS (DOUBLE PANED)					150.00 SQ. FT	
Unit values		0.00	19.56	2.41	0.09	0.00	22.06
Totals		0.00	\$2,934	\$362	\$14	\$0	\$3,310
U00		0	\$2,934	\$362	\$14	\$0	\$3,310

=====						
Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1611350023	LOW VOLTAGE WIRE #18-4C					
Unit values	1.23	15.40	34.00	0.00	5.00 CLF	
Totals	6.15	\$77	\$170	\$0	0.00	49.40
					\$0	\$247
1611750101	LIGHTING CONTACTOR					
Unit values	2.00	137.00	55.00	0.00	2.00 EA.	
Totals	4.00	\$274	\$110	\$0	0.00	192.00
					\$0	\$384
1611850101	PHOTO SWITCH 50-500 FC ADJUSTABLE					
Unit values	1.00	290.00	27.50	0.00	2.00 EA.	
Totals	2.00	\$580	\$55	\$0	0.00	317.50
					\$0	\$635
1611870101	LOW VOLTAGE TRANS 115V-24V					
Unit values	0.67	64.00	18.35	0.00	1.00 EA.	
Totals	0.67	\$64	\$18	\$0	0.00	82.35
					\$0	\$82
1611870102	SWITCHING RELAYS					
Unit values	0.50	11.30	13.75	0.00	4.00 EA.	
Totals	2.00	\$45	\$55	\$0	0.00	25.05
					\$0	\$100
1611950101	1/2" EMT					
Unit values	0.05	0.38	1.29	0.00	340.00 LF	
Totals	17.00	\$129	\$439	\$0	0.00	1.67
					\$0	\$568
U16 ELECTRICAL	32	\$1,169	\$847	\$0	\$0	\$2,016

```
=====
Line #      Description
-----
      Manhours   Matl      Labor   Equipment   Sub      Total
=====
```

ESTIMATE TOTAL	32	\$4,103	\$1,209	\$14	\$0	\$5,326
SALES TAX	5.00%	\$205				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$4,308	\$1,209	\$14	\$0	\$5,531
CONTINGENCY	5.00%					\$277
BOND	5.00%					\$277
PROFIT	10.00%					\$553
JOB TOTAL						\$6,637

```

=====
Estimate:      BLDG 4242      Date:      FEBRUARY 2, 1995
Description:   CONVENTIONAL SKYLIGHT & CONTROLS
Project:       HANGAR STUDY   Bid Date:  FEBRUARY 2, 1995
Location:     BLDG 4242      Job #:      94013.04
Sq. footage:   City indx:Raleigh, NC
=====

```

SUMMARY

```

=====
Manhours  Matl  Labor  Equipment  Sub  Total
=====
U00              0  $2,934  $362  $14  $0  $3,310
U16 ELECTRICAL  32  $1,169  $847  $0  $0  $2,016
TOTAL          32  $4,103  $1,209  $14  $0  $5,326

SALES TAX      5.00%  $205
MATL MARKUP    0.00%  $0
LABOR MARKUP   0.00%  $0
EQUIPT MARKUP  0.00%  $0
SUB MARKUP     0.00%  $0

TOTAL BEFORE CONTINGENC  $4,308  $1,209  $14  $0  $5,531
CONTINGENCY      5.00%  $277
BOND              5.00%  $277
PROFIT           10.00%  $553

JOB TOTAL                                $6,637

```

LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 7937

LCCID FY95 (92)

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 7937 SKY LIGHTS & LIGHTING PRODUCTS @ HANGARS

FISCAL YEAR 95 DISCRETE PORTION NAME: LIGHTING

ANALYSIS DATE: 02-03-95 ECONOMIC LIFE 10 YEARS PREPARED BY: JAH

1. INVESTMENT

A. CONSTRUCTION COST	\$	56709.	
B. SIOH	\$	2835.	
C. DESIGN COST	\$	2835.	
D. TOTAL COST (1A+1B+1C)	\$	62380.	
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.	
F. PUBLIC UTILITY COMPANY REBATE	\$	0.	
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$		62380.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1993

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	156.	\$ 5456.	8.77	\$ 47850.
B. DIST	\$.00	0.	\$ 0.	9.26	\$ 0.
C. RESID	\$.00	0.	\$ 0.	10.08	\$ 0.
D. NAT G	\$.00	0.	\$ 0.	10.39	\$ 0.
E. COAL	\$.00	0.	\$ 0.	9.39	\$ 0.
F. LPG	\$.00	0.	\$ 0.	8.78	\$ 0.
M. DEMAND SAVINGS			\$ 5103.	8.49	\$ 43324.
N. TOTAL		156.	\$ 10559.		\$ 91174.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$	1047.
(1) DISCOUNT FACTOR (TABLE A)	8.49		
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$	8889.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTOR (3)	DISCOUNTED SAVINGS(+)/ COST(-)(4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-)(3A2+3Bd4)\$ 8889.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ 11606.

5. SIMPLE PAYBACK PERIOD (1G/4) 5.37 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 100063.

7. SAVINGS TO INVESTMENT RATIO (SIR)=(6 / 1G)= 1.60
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 8.09 %

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
16 DECEMBER 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 7937 - HANGAR	ELECTRIC COSTS:	
AREA USE: _____	ENERGY CHARGE	\$0.03495 PER KWH
HOURS/DAY: 18	DEMAND CHARGE	\$9.25 PER KW
DAYS/WEEK: 7		

EXISTING FIXTURE DATA		REPLACEMENT FIXTURE DATA	
2 FOOT	2 LAMP U @ 92 W/FIXT = 0 WATTS	2 FOOT	0 2 LAMP U @ 58 W/FIXT = 0 WATTS
4 FOOT	1 LAMP @ 45 W/FIXT = 0 WATTS 103 2 LAMP @ 92 W/FIXT = 9,476 WATTS 62 3 LAMP @ 137 W/FIXT = 8,494 WATTS 4 LAMP @ 184 W/FIXT = 0 WATTS	4 FOOT	0 2 LAMP @ 29 W/FIXT = 0 WATTS 165 2 LAMP @ 58 W/FIXT = 9,570 WATTS 0 3 LAMP @ 87 W/FIXT = 0 WATTS 0 4 LAMP @ 118 W/FIXT = 0 WATTS
8 FOOT	2 LAMP @ 144 W/FIXT = 0 WATTS	8 FOOT	0 2 LAMP @ 125 W/FIXT = 0 WATTS
BASELINE ENERGY CONSUMPTION 117,739 KWH/YR		ECO ENERGY CONSUMPTION 62,703 KWH/YR	
BASELINE DEMAND 17.97 KW		ECO DEMAND 9.57 KW	

NET ENERGY SAVINGS	55,037 KWH/YR	NET DEMAND SAVINGS	\$932 /YR
		NET DOLLAR SAVINGS	\$2,856 /YR

MAINTENANCE SAVINGS

62 LAMPS @ \$5.00 / 20,000 HOURS *	6,570 HR/YR = \$102 / YEAR	(4' FLUORESCENT LAMPS)
NET MAINTENANCE SAVINGS		\$102 /YEAR

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
16 DECEMBER 1994

INTERIOR LIGHTING: EXIT SIGN REPLACEMENT

BUILDING #: 7937 - HANGAR

ELECTRIC COSTS:
ENERGY CHARGE
DEMAND CHARGE

\$0.03495 PER KWH
\$9.25 PER KW

INCANDESCENT EXIT SIGNS		FLUORESCENT EXIT SIGNS		REPLACEMENT SIGNS	
# OF EXIT SIGNS:	14	# OF EXIT SIGNS:	0	# OF EXIT SIGNS:	14
WATTAGE:	30	WATTAGE:	18	WATTAGE:	3
BASELINE ENERGY CONSUMPTION		3,679 KWH/YR	ECO ENERGY CONSUMPTION	368 KWH/YR	
BASELINE DEMAND		0.42 KW	ECO DEMAND	0.04 KW	

NET ENERGY SAVINGS	3,311 KWH/YR	NET DEMAND SAVINGS	\$42 /YR
		NET DOLLAR SAVINGS	\$158 /YR

MAINTENANCE SAVINGS

14 LAMPS @ \$3.50 / 1,000 HOURS *	8,760 HR/YR =	\$429 / YEAR	(INCANDESCENT)
LAMPS @	/ 10,000 HOURS *	HR/YR =	\$0 / YEAR
			(COMPACT FLUORESCENT)
NET MAINTENANCE SAVINGS		\$429 /YEAR	

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
02 FEBRUARY 1995

CONVENTIONAL SKY LIGHTS IN HANGARS

BUILDING #: 7937 - HANGAR

ELECTRIC COSTS:
ENERGY CHARGE \$0.03495 PER KWH
DEMAND CHARGE \$9.25 PER KW

WATTAGE CONTROLLED: 37,200 W
PEAK USE: 1 (1-YES, 0-NO)

CURRENT USAGE: 8,760 HOURS/YEAR
REVISED USAGE: 6,132 HOURS/YEAR

BASELINE ENERGY CONSUMPTION	325,872 KWH/YR	ECO ENERGY CONSUMPTION	228,110 KWH/YR	
BASELINE DEMAND	37.2 KW	ECO DEMAND	37.2 KW	

NET ENERGY SAVINGS	97,762 KWH/YR	NET DEMAND SAVINGS	\$4,129 /YR	
		NET DOLLAR SAVINGS	\$7,546 /YR	

MAINTENANCE SAVINGS

124 LAMPS @ \$38.00 / 24,000 HOURS *	8,760 HR/YR =	\$1,720 / YEAR	(WITHOUT SKYLIGHTS)
124 LAMPS @ \$38.00 / 24,000 HOURS *	6,132 HR/YR =	\$1,204 / YEAR	(WITH SKYLIGHTS)

NET MAINTENANCE SAVINGS \$516 /YEAR

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=====
Estimate:      LIGHTING UPGRADE   Date:      FEBRUARY 2, 1995
Description:   LIGHTING PRODUCT UPGRADE
Project:       HANGAR LIGHTING   Bid Date:  FEBRUARY 2, 1995
Location:      BLDG 7937         Job #:     94013.04
Sq. footage:   City indx:Raleigh, NC
=====

```

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0002000000	DEMOLITION, 2X4 FLUORESCENT FIXTURES					110.00	FIXTURE
Unit values	0.49	0.00	13.35	0.00	0.00		13.35
Totals	53.90	\$0	\$1,469	\$0	\$0		\$1,469
0002010000	DEMOLITION, INCANDESCENT FIXTURES/EXIT SIGNS					14.00	FIXTURE
Unit values	0.26	0.00	7.10	0.00	0.00		7.10
Totals	3.64	\$0	\$99	\$0	\$0		\$99
0002020000	DEMOLITION, 1X4 FLUORESCENT FIXTURES					55.00	FIXTURE
Unit values	0.49	0.00	13.35	0.00	0.00		13.35
Totals	26.95	\$0	\$734	\$0	\$0		\$734
0010000000	1X4 2-32 WATT FLUORESCENT LAMPS, SURFACE MOUNTED					45.00	FIXTURE
Unit values	1.14	60.00	31.50	0.00	0.00		91.50
Totals	51.30	\$2,700	\$1,418	\$0	\$0		\$4,118
0010100000	2X4 2-32 WATT FLUORESCENT LAMPS, RECESSED MOUNTED					48.00	FIXTURE
Unit values	1.51	59.00	41.50	0.00	0.00		100.50
Totals	72.48	\$2,832	\$1,992	\$0	\$0		\$4,824
0010200000	1X4 2-32 WATT FLUORESCENT LAMPS, RECESSED MOUNTED					4.00	FIXTURE
Unit values	1.14	51.00	31.50	0.00	0.00		82.50
Totals	4.56	\$204	\$126	\$0	\$0		\$330
0010300000	1X4 2-32 WATT FLUORESCENT LAMPS, WALL MOUNTED					6.00	FIXTURE
Unit values	1.14	60.00	31.50	0.00	0.00		91.50
Totals	6.84	\$360	\$189	\$0	\$0		\$549
0010500000	2X4 2-32 WATT FLUORESCENT LAMPS, RECESSED MOUNTED WITH REFLECTORS					62.00	FIXTURE
Unit values	1.51	75.00	41.50	0.00	0.00		116.50
Totals	93.62	\$4,650	\$2,573	\$0	\$0		\$7,223
0010700000	LED EXIT SIGN, RETROFIT KIT					14.00	FIXTURE

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MeansData for Lotus

Page 2

Unit values	1.00	35.00	27.50	0.00	0.00	62.50
Totals	14.00	\$490	\$385	\$0	\$0	\$875

```
=====
Line #      Description
-----
      Manhours   Matl    Labor   Equipment   Sub    Total
=====
U00          328    $11,236    $8,985         $0        $0    $20,221

ESTIMATE TOTAL      328    $11,236    $8,985         $0        $0    $20,221

SALES TAX           5.00%        $562
MATL MARKUP         0.00%        $0
LABOR MARKUP        0.00%         $0
EQUIPT MARKUP       0.00%         $0
SUB MARKUP          0.00%         $0

TOTAL BEFORE CONTINGENC $11,798    $8,985         $0        $0    $20,783
CONTINGENCY           5.00%         $1,039
BOND                  5.00%         $1,039
PROFIT               10.00%         $2,078

JOB TOTAL                                $24,939
=====
```

```

=====
Estimate:      LIGHTING UPGRADE   Date:      FEBRUARY 2, 1995
Description:   LIGHTING PRODUCT UPGRADE
Project:      HANGAR LIGHTING   Bid Date: FEBRUARY 2, 1995
Location:     BLDG 7937         Job #:      94013.04
Sq. footage:                      City indx:Raleigh, NC
=====

```

SUMMARY

```

=====
              Manhours   Matl      Labor   Equipment   Sub      Total
=====
U00              328     $11,236    $8,985         $0         $0    $20,221
TOTAL              328     $11,236    $8,985         $0         $0    $20,221

SALES TAX          5.00%         $562
MATL MARKUP        0.00%         $0
LABOR MARKUP        0.00%         $0
EQUIPT MARKUP       0.00%         $0
SUB MARKUP          0.00%         $0

TOTAL BEFORE CONTINGENC $11,798    $8,985         $0         $0    $20,783
CONTINGENCY          5.00%                $1,039
BOND                 5.00%                $1,039
PROFIT               10.00%               $2,078

JOB TOTAL                                $24,939
=====

```

```

=====
Estimate:      BLDG 7937          Date:      FEBRUARY 2, 1995
Description:   CONVENTIONAL SKYLIGHT & CONTROLS
Project:      HANGAR STUDY       Bid Date:  FEBRUARY 2, 1995
Location:     BLDG 7937         Job #:      94013.04
Sq. footage:   City indx:Raleigh, NC
=====

```

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0060000001	CONVENTIONAL SKYLIGHT WITH 4" INSULATED CURBS (DOUBLE PANED)					960.00 SQ. FT	
Unit values		0.00	19.56	2.41	0.09	0.00	22.06
Totals		0.00	\$18,778	\$2,314	\$86	\$0	\$21,178
U00		0	\$18,778	\$2,314	\$86	\$0	\$21,178

=====						
Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1611350023	LOW VOLTAGE WIRE #18-4C					
Unit values	1.23	15.40	34.00	0.00	14.00 CLF	
Totals	17.22	\$216	\$476	\$0	0.00	49.40
					\$0	\$692
1611750101	LIGHTING CONTACTOR					
Unit values	2.00	137.00	55.00	0.00	6.00 EA.	
Totals	12.00	\$822	\$330	\$0	0.00	192.00
					\$0	\$1,152
1611850101	PHOTO SWITCH 50-500 FC ADJUSTABLE					
Unit values	1.00	290.00	27.50	0.00	4.00 EA.	
Totals	4.00	\$1,160	\$110	\$0	0.00	317.50
					\$0	\$1,270
1611870101	LOW VOLTAGE TRANS 115V-24V					
Unit values	0.67	64.00	18.35	0.00	1.00 EA.	
Totals	0.67	\$64	\$18	\$0	0.00	82.35
					\$0	\$82
1611870102	SWITCHING RELAYS					
Unit values	0.50	11.30	13.75	0.00	8.00 EA.	
Totals	4.00	\$90	\$110	\$0	0.00	25.05
					\$0	\$200
1611950101	1/2" EMT					
Unit values	0.05	0.38	1.29	0.00	500.00 LF	
Totals	25.00	\$190	\$645	\$0	0.00	1.67
					\$0	\$835
U16 ELECTRICAL	63	\$2,542	\$1,689	\$0	\$0	\$4,231

02-Feb-95

MeansData for Lotus

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```
=====
Line #      Description
-----
      Manhours   Matl    Labor   Equipment   Sub    Total
=====
```

ESTIMATE TOTAL	63	\$21,320	\$4,003	\$86	\$0	\$25,409
SALES TAX	5.00%	\$1,066				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$22,386	\$4,003	\$86	\$0	\$26,475
CONTINGENCY	5.00%					\$1,324
BOND	5.00%					\$1,324
PROFIT	10.00%					\$2,648
JOB TOTAL						\$31,770

```

=====
Estimate:      BLDG 7937          Date:      FEBRUARY 2, 1995
Description:   CONVENTIONAL SKYLIGHT & CONTROLS
Project:       HANGAR STUDY      Bid Date:  FEBRUARY 2, 1995
Location:     BLDG 7937         Job #:     94013.04
Sq. footage:   City indx:Raleigh, NC
=====

```

SUMMARY

```

=====
Manhours  Matl  Labor  Equipment  Sub  Total
=====
U00              0  $18,778  $2,314      $86      $0  $21,178
U16 ELECTRICAL  63  $2,542  $1,689      $0      $0  $4,231
TOTAL          63  $21,320  $4,003      $86      $0  $25,409

SALES TAX      5.00%  $1,066
MATL MARKUP    0.00%      $0
LABOR MARKUP   0.00%      $0
EQUIPT MARKUP  0.00%      $0
SUB MARKUP     0.00%      $0

TOTAL BEFORE CONTINGENC  $22,386  $4,003  $86  $0  $26,475
CONTINGENCY      5.00%      $1,324
BOND              5.00%      $1,324
PROFIT           10.00%      $2,648

JOB TOTAL                                $31,770

```

LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 8944

LCCID FY95 (92)

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 8944 SKY LIGHTS & LIGHTING PRODUCTS @ HANGARS

FISCAL YEAR 95 DISCRETE PORTION NAME: LIGHTING

ANALYSIS DATE: 02-03-95 ECONOMIC LIFE 10 YEARS PREPARED BY: JAH

1. INVESTMENT

A. CONSTRUCTION COST	\$	46670.		
B. SIOH	\$	2334.		
C. DESIGN COST	\$	2334.		
D. TOTAL COST (1A+1B+1C)	\$	51337.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$		0.	
F. PUBLIC UTILITY COMPANY REBATE	\$		0.	
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$			51337.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1993

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	111.	\$ 3879.	8.77	\$ 34017.
B. DIST	\$.00	0.	\$ 0.	9.26	\$ 0.
C. RESID	\$.00	0.	\$ 0.	10.08	\$ 0.
D. NAT G	\$.00	0.	\$ 0.	10.39	\$ 0.
E. COAL	\$.00	0.	\$ 0.	9.39	\$ 0.
F. LPG	\$.00	0.	\$ 0.	8.78	\$ 0.
M. DEMAND SAVINGS			\$ 4023.	8.49	\$ 34155.
N. TOTAL		111.	\$ 7902.		\$ 68173.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$ 793.
(1) DISCOUNT FACTOR (TABLE A)	8.49	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$ 6733.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-)(4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-)(3A2+3Bd4)\$ 6733.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ 8695.

5. SIMPLE PAYBACK PERIOD (1G/4) 5.90 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 74905.

7. SAVINGS TO INVESTMENT RATIO (SIR)=(6 / 1G)= 1.46
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 7.07 %

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
16 DECEMBER 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 8944 - HANGAR

ELECTRIC COSTS:

ENERGY CHARGE \$0.03495 PER KWH
DEMAND CHARGE \$9.25 PER KW

AREA USE: _____
HOURS/DAY 18
DAYS/WEEK 7

EXISTING FIXTURE DATA

2 FOOT 2 LAMP U @ 92 W/FIXT = 0 WATTS

4 FOOT

1 LAMP @ 45 W/FIXT = 0 WATTS

95 2 LAMP @ 92 W/FIXT = 8,740 WATTS

4 3 LAMP @ 137 W/FIXT = 548 WATTS

4 LAMP @ 184 W/FIXT = 0 WATTS

8 FOOT 2 LAMP @ 144 W/FIXT = 0 WATTS

REPLACEMENT FIXTURE DATA

2 FOOT 0 2 LAMP U @ 58 W/FIXT = 0 WATTS

4 FOOT

0 2 LAMP @ 29 W/FIXT = 0 WATTS

99 2 LAMP @ 58 W/FIXT = 5,742 WATTS

0 3 LAMP @ 87 W/FIXT = 0 WATTS

0 4 LAMP @ 118 W/FIXT = 0 WATTS

8 FOOT 0 2 LAMP @ 125 W/FIXT = 0 WATTS

BASELINE ENERGY CONSUMPTION 60,855 KWH/YR ECO ENERGY CONSUMPTION 37,822 KWH/YR

BASELINE DEMAND 9.29 KW ECO DEMAND 5.74 KW

NET ENERGY SAVINGS 23,233 KWH/YR

NET DEMAND SAVINGS \$394 /YR
NET DOLLAR SAVINGS \$1,206 /YR

MAINTENANCE SAVINGS

4 LAMPS @ \$5.00 / 20,000 HOURS * 6,570 HR/YR = \$7 / YEAR (4' FLUORESCENT LAMPS)

NET MAINTENANCE SAVINGS \$7 /YEAR

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
16 DECEMBER 1994

INTERIOR LIGHTING: EXIT SIGN REPLACEMENT

BUILDING #: 8944 - HANGAR

ELECTRIC COSTS:
ENERGY CHARGE
DEMAND CHARGE

\$0.03495 PER KWH
\$9.25 PER KW

INCANDESCENT EXIT SIGNS

OF EXIT SIGNS: 11
WATTAGE: 30

FLUORESCENT EXIT SIGNS

OF EXIT SIGNS: 0
WATTAGE: 18

REPLACEMENT SIGNS

OF EXIT SIGNS: 11
WATTAGE: 3

BASELINE ENERGY CONSUMPTION

2,891 KWH/YR

ECO ENERGY CONSUMPTION

289 KWH/YR

BASELINE DEMAND

0.33 KW

ECO DEMAND

0.03 KW

NET ENERGY SAVINGS

2,602 KWH/YR

NET DEMAND SAVINGS

\$33 /YR
\$124 /YR

MAINTENANCE SAVINGS

11 LAMPS @ \$3.50 / 1,000 HOURS *
LAMPS @ / 10,000 HOURS *

8,760 HR/YR =
HR/YR =

\$337 / YEAR
\$0 / YEAR

(INCANDESCENT)
(COMPACT FLUORESCENT)

NET MAINTENANCE SAVINGS

\$337 /YEAR

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
02 FEBRUARY 1995

CONVENTIONAL SKY LIGHTS IN HANGARS

BUILDING #: 8944 - HANGAR

ELECTRIC COSTS:
ENERGY CHARGE
DEMAND CHARGE

\$0.03495 PER KWH
\$9.25 PER KW

WATTAGE CONTROLLED: 32,400 W
PEAK USE: 1 (1-YES, 0-NO)

CURRENT USAGE:
HOURS/YEAR

8,760

REVISED USAGE:
HOURS/YEAR

6,132

BASELINE ENERGY CONSUMPTION

283,824 KWH/YR

ECO ENERGY CONSUMPTION

198,677 KWH/YR

BASELINE DEMAND

32.4 KW

ECO DEMAND

32.4 KW

NET ENERGY SAVINGS

85,147 KWH/YR

NET DEMAND SAVINGS

\$3,596 /YR

NET DOLLAR SAVINGS

\$6,572 /YR

MAINTENANCE SAVINGS

108 LAMPS @ \$38.00 / 24,000 HOURS *
108 LAMPS @ \$38.00 / 24,000 HOURS *

8,760 HR/YR = \$1,498 / YEAR
6,132 HR/YR = \$1,049 / YEAR

(WITHOUT SKYLIGHTS)
(WITH SKYLIGHTS)

NET MAINTENANCE SAVINGS

\$449 /YEAR

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=====
Estimate:      LIGHTING UPGRADE   Date:      FEBRUARY 2, 1995
Description:    LIGHTING PRODUCT UPGRADE
Project:        HANGAR LIGHTING   Bid Date:  FEBRUARY 2, 1995
Location:       BLDG 8944         Job #:    94013.04
Sq. footage:    City indx:Raleigh, NC
=====

```

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0002000000	DEMOLITION, 2X4 FLUORESCENT FIXTURES						
						99.00	FIXTURE
Unit values	0.49	0.00	13.35	0.00	0.00		13.35
Totals	48.51	\$0	\$1,322	\$0	\$0		\$1,322
0002010000	DEMOLITION, INCANDESCENT FIXTURES/EXIT SIGNS						
						11.00	FIXTURE
Unit values	0.26	0.00	7.10	0.00	0.00		7.10
Totals	2.86	\$0	\$78	\$0	\$0		\$78
0010100000	2X4 2-32 WATT FLUORESCENT LAMPS, RECESSED MOUNTED						
						95.00	FIXTURE
Unit values	1.51	59.00	41.50	0.00	0.00		100.50
Totals	143.45	\$5,605	\$3,943	\$0	\$0		\$9,548
0010500000	2X4 2-32 WATT FLUORESCENT LAMPS, RECESSED MOUNTED WITH REFLECTORS						
						4.00	FIXTURE
Unit values	1.51	75.00	41.50	0.00	0.00		116.50
Totals	6.04	\$300	\$166	\$0	\$0		\$466
0010700000	LED EXIT SIGN, RETROFIT KIT						
						11.00	FIXTURE
Unit values	1.00	35.00	27.50	0.00	0.00		62.50
Totals	11.00	\$385	\$303	\$0	\$0		\$688
U00		212	\$6,290	\$5,812	\$0	\$0	\$12,102

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
ESTIMATE TOTAL		212	\$6,290	\$5,812	\$0	\$0	\$12,102
SALES TAX	5.00%		\$315				
MATL MARKUP	0.00%		\$0				
LABOR MARKUP	0.00%			\$0			
EQUIPT MARKUP	0.00%				\$0		
SUB MARKUP	0.00%					\$0	
TOTAL BEFORE CONTINGENC			\$6,605	\$5,812	\$0	\$0	\$12,417
CONTINGENCY	5.00%						\$621
BOND	5.00%						\$621
PROFIT	10.00%						\$1,242
JOB TOTAL							\$14,900

03-Feb-95

MeansData for Lotus

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=====
Estimate:    LIGHTING UPGRADE   Date:    FEBRUARY 2, 1995
Description: LIGHTING PRODUCT UPGRADE
Project:     HANGAR LIGHTING   Bid Date: FEBRUARY 2, 1995
Location:    BLDG 8944         Job #:    94013.04
Sq. footage:                      City indx:Raleigh, NC
=====

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SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
U00	212	\$6,290	\$5,812	\$0	\$0	\$12,102
TOTAL	212	\$6,290	\$5,812	\$0	\$0	\$12,102
SALES TAX	5.00%	\$315				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$6,605	\$5,812	\$0	\$0	\$12,417
CONTINGENCY	5.00%					\$621
BOND	5.00%					\$621
PROFIT	10.00%					\$1,242
JOB TOTAL						\$14,900

02-Feb-95

MeansData for Lotus

Page 1

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=====
Estimate:      BLDG 8944      Date:      FEBRUARY 2, 1995
Description:   CONVENTIONAL SKYLIGHT & CONTROLS
Project:      HANGAR STUDY   Bid Date: FEBRUARY 2, 1995
Location:     BLDG 8944      Job #:     94013.04
Sq. footage:   City indx:Raleigh, NC
=====

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Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0060000001	CONVENTIONAL SKYLIGHT WITH 4" INSULATED CURBS (DOUBLE PANED)					960.00 SQ. FT	
Unit values		0.00	19.56	2.41	0.09	0.00	22.06
Totals		0.00	\$18,778	\$2,314	\$86	\$0	\$21,178
U00		0	\$18,778	\$2,314	\$86	\$0	\$21,178

=====						
Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1611350023	LOW VOLTAGE WIRE #18-4C					
					14.00 CLF	
Unit values	1.23	15.40	34.00	0.00	0.00	49.40
Totals	17.22	\$216	\$476	\$0	\$0	\$692
1611750101	LIGHTING CONTACTOR					
					6.00 EA.	
Unit values	2.00	137.00	55.00	0.00	0.00	192.00
Totals	12.00	\$822	\$330	\$0	\$0	\$1,152
1611850101	PHOTO SWITCH 50-500 FC ADJUSTABLE					
					4.00 EA.	
Unit values	1.00	290.00	27.50	0.00	0.00	317.50
Totals	4.00	\$1,160	\$110	\$0	\$0	\$1,270
1611870101	LOW VOLTAGE TRANS 115V-24V					
					1.00 EA.	
Unit values	0.67	64.00	18.35	0.00	0.00	82.35
Totals	0.67	\$64	\$18	\$0	\$0	\$82
1611870102	SWITCHING RELAYS					
					8.00 EA.	
Unit values	0.50	11.30	13.75	0.00	0.00	25.05
Totals	4.00	\$90	\$110	\$0	\$0	\$200
1611950101	1/2" EMT					
					500.00 LF	
Unit values	0.05	0.38	1.29	0.00	0.00	1.67
Totals	25.00	\$190	\$645	\$0	\$0	\$835
U16 ELECTRICAL	63	\$2,542	\$1,689	\$0	\$0	\$4,231

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=====
Line #      Description
-----
      Manhours   Matl    Labor   Equipment   Sub    Total
=====
```

ESTIMATE TOTAL	63	\$21,320	\$4,003	\$86	\$0	\$25,409
SALES TAX	5.00%	\$1,066				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$22,386	\$4,003	\$86	\$0	\$26,475
CONTINGENCY	5.00%					\$1,324
BOND	5.00%					\$1,324
PROFIT	10.00%					\$2,648
JOB TOTAL						\$31,770

```

=====
Estimate:      BLDG 8944      Date:      FEBRUARY 2, 1995
Description:   CONVENTIONAL SKYLIGHT & CONTROLS
Project:       HANGAR STUDY   Bid Date:  FEBRUARY 2, 1995
Location:     BLDG 8944      Job #:     94013.04
Sq. footage:   City indx:Raleigh, NC
=====

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SUMMARY

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=====
Manhours  Matl  Labor  Equipment  Sub  Total
=====
U00              0  $18,778  $2,314      $86      $0  $21,178
U16 ELECTRICAL  63  $2,542  $1,689      $0      $0  $4,231
TOTAL          63  $21,320  $4,003      $86      $0  $25,409

SALES TAX      5.00%  $1,066
MATL MARKUP    0.00%    $0
LABOR MARKUP   0.00%      $0
EQUIPT MARKUP  0.00%      $0
SUB MARKUP     0.00%      $0

TOTAL BEFORE CONTINGENC  $22,386  $4,003  $86  $0  $26,475
CONTINGENCY      5.00%      $1,324
BOND              5.00%      $1,324
PROFIT           10.00%      $2,648

JOB TOTAL                                $31,770
=====

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LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 9647

LCCID FY95 (92)

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 9647 SKY LIGHTS & LIGHTING PRODUCTS @ HANGARS

FISCAL YEAR 95 DISCRETE PORTION NAME: LIGHTING

ANALYSIS DATE: 02-03-95 ECONOMIC LIFE 10 YEARS PREPARED BY: JAH

1. INVESTMENT

A. CONSTRUCTION COST	\$	53422.		
B. SIOH	\$	2671.		
C. DESIGN COST	\$	2671.		
D. TOTAL COST (1A+1B+1C)	\$	58764.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.		
F. PUBLIC UTILITY COMPANY REBATE	\$	0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$		58764.	

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1993

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	121.	\$ 4238.	8.77	\$ 37167.
B. DIST	\$.00	0.	\$ 0.	9.26	\$ 0.
C. RESID	\$.00	0.	\$ 0.	10.08	\$ 0.
D. NAT G	\$.00	0.	\$ 0.	10.39	\$ 0.
E. COAL	\$.00	0.	\$ 0.	9.39	\$ 0.
F. LPG	\$.00	0.	\$ 0.	8.78	\$ 0.
M. DEMAND SAVINGS			\$ 3838.	8.49	\$ 32585.
N. TOTAL		121.	\$ 8076.		\$ 69751.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$	747.
(1) DISCOUNT FACTOR (TABLE A)	8.49		
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$	6342.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-)(4)
d. TOTAL	\$	0.		0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-)(3A2+3Bd4)\$ 6342.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ 8823.

5. SIMPLE PAYBACK PERIOD (1G/4) 6.66 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 76093.

7. SAVINGS TO INVESTMENT RATIO (SIR)=(6 / 1G)= 1.29
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 5.80 %

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
16 DECEMBER 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 9647 - HANGAR

ELECTRIC COSTS:

ENERGY CHARGE \$0.03495 PER KWH
DEMAND CHARGE \$9.25 PER KW

AREA USE: _____
HOURS/DAY 18
DAYS/WEEK 7

EXISTING FIXTURE DATA

2 FOOT 2 LAMP U @ 92 W/FIXT = 0 WATTS

4 FOOT

1 LAMP @ 45 W/FIXT = 0 WATTS

163 2 LAMP @ 92 W/FIXT = 14,996 WATTS

22 3 LAMP @ 137 W/FIXT = 3,014 WATTS

4 LAMP @ 184 W/FIXT = 0 WATTS

8 FOOT 2 LAMP @ 144 W/FIXT = 0 WATTS

REPLACEMENT FIXTURE DATA

2 FOOT 0 2 LAMP U @ 58 W/FIXT = 0 WATTS

4 FOOT

0 2 LAMP @ 29 W/FIXT = 0 WATTS

185 2 LAMP @ 58 W/FIXT = 10,730 WATTS

0 3 LAMP @ 87 W/FIXT = 0 WATTS

0 4 LAMP @ 118 W/FIXT = 0 WATTS

8 FOOT 0 2 LAMP @ 125 W/FIXT = 0 WATTS

BASELINE ENERGY CONSUMPTION 118,002 KWH/YR ECO ENERGY CONSUMPTION 70,303 KWH/YR

BASELINE DEMAND 18.01 KW ECO DEMAND 10.73 KW

NET ENERGY SAVINGS	47,699 KWH/YR	NET DEMAND SAVINGS \$808 /YR
		NET DOLLAR SAVINGS \$2,475 /YR

MAINTENANCE SAVINGS

22 LAMPS @ \$5.00 / 20,000 HOURS * 6,570 HR/YR = \$36 / YEAR (4' FLUORESCENT LAMPS)

NET MAINTENANCE SAVINGS \$36 /YEAR

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
16 DECEMBER 1994

INTERIOR LIGHTING: EXIT SIGN REPLACEMENT

BUILDING #: 9647 - HANGAR _____

ELECTRIC COSTS:
ENERGY CHARGE \$0.03495 PER KWH
DEMAND CHARGE \$9.25 PER KW

INCANDESCENT EXIT SIGNS	FLUORESCENT EXIT SIGNS	REPLACEMENT SIGNS
# OF EXIT SIGNS: 11	# OF EXIT SIGNS: 0	# OF EXIT SIGNS: 11
WATTAGE: 30	WATTAGE: 18	WATTAGE: 3
BASELINE ENERGY CONSUMPTION 2,891 KWH/YR	ECO ENERGY CONSUMPTION 289 KWH/YR	
BASELINE DEMAND 0.33 KW	ECO DEMAND 0.03 KW	

NET ENERGY SAVINGS 2,602 KWH/YR NET DEMAND SAVINGS \$33 /YR
NET DOLLAR SAVINGS \$124 /YR

MAINTENANCE SAVINGS

11 LAMPS @ \$3.50 / 1,000 HOURS * 8,760 HR/YR = \$337 / YEAR (INCANDESCENT)
LAMPS @ / 10,000 HOURS * HR/YR = \$0 / YEAR (COMPACT FLUORESCENT)

NET MAINTENANCE SAVINGS \$337 /YEAR

FORT BRAGG LIMITED ENERGY STUDY

OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
02 FEBRUARY 1995

CONVENTIONAL SKY LIGHTS IN HANGARS

BUILDING #: 9647 - HANGAR

ELECTRIC COSTS:
ENERGY CHARGE \$0.03495 PER KWH
DEMAND CHARGE \$9.25 PER KW

WATTAGE CONTROLLED: 27,000 W
PEAK USE: 1 (1-YES, 0-NO)

CURRENT USAGE:
HOURS/YEAR 8,760

REVISED USAGE:
HOURS/YEAR 6,132

BASELINE ENERGY CONSUMPTION	236,520 KWH/YR	ECO ENERGY CONSUMPTION	165,564 KWH/YR
BASELINE DEMAND	27 KW	ECO DEMAND	27 KW

NET ENERGY SAVINGS	70,956 KWH/YR	NET DEMAND SAVINGS	\$2,997 /YR
		NET DOLLAR SAVINGS	\$5,477 /YR

MAINTENANCE SAVINGS

90 LAMPS @ \$38.00 / 24,000 HOURS *	8,760 HR/YR =	\$1,248 / YEAR	(WITHOUT SKYLIGHTS)
90 LAMPS @ \$38.00 / 24,000 HOURS *	6,132 HR/YR =	\$874 / YEAR	(WITH SKYLIGHTS)

NET MAINTENANCE SAVINGS \$374 /YEAR

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=====
Estimate:      LIGHTING UPGRADE   Date:      FEBRUARY 2, 1995
Description:   LIGHTING PRODUCT UPGRADE
Project:      HANGAR LIGHTING   Bid Date: FEBRUARY 2, 1995
Location:     BLDG9647         Job #:     94013.04
Sq. footage:                      City indx:Raleigh, NC
=====

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Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0002000000	DEMOLITION, 2X4 FLUORESCENT FIXTURES					148.00	FIXTURE
Unit values	0.49	0.00	13.35	0.00	0.00		13.35
Totals	72.52	\$0	\$1,976	\$0	\$0		\$1,976
0002010000	DEMOLITION, INCANDESCENT FIXTURES/EXIT SIGNS					11.00	FIXTURE
Unit values	0.26	0.00	7.10	0.00	0.00		7.10
Totals	2.86	\$0	\$78	\$0	\$0		\$78
0002020000	DEMOLITION, 1X4 FLUORESCENT FIXTURES					37.00	FIXTURE
Unit values	0.49	0.00	13.35	0.00	0.00		13.35
Totals	18.13	\$0	\$494	\$0	\$0		\$494
0010100000	2X4 2-32 WATT FLUORESCENT LAMPS, RECESSED MOUNTED					126.00	FIXTURE
Unit values	1.51	59.00	41.50	0.00	0.00		100.50
Totals	190.26	\$7,434	\$5,229	\$0	\$0		\$12,663
0010300000	1X4 2-32 WATT FLUORESCENT LAMPS, WALL MOUNTED					26.00	FIXTURE
Unit values	1.14	60.00	31.50	0.00	0.00		91.50
Totals	29.64	\$1,560	\$819	\$0	\$0		\$2,379
0010400000	1X4 2-32 WATT FLUORESCENT LAMPS, PENDANT MOUNTED					11.00	FIXTURE
Unit values	1.14	39.00	31.50	0.00	0.00		70.50
Totals	12.54	\$429	\$347	\$0	\$0		\$776
0010500000	2X4 2-32 WATT FLUORESCENT LAMPS, RECESSED MOUNTED WITH REFLECTORS					22.00	FIXTURE
Unit values	1.51	75.00	41.50	0.00	0.00		116.50
Totals	33.22	\$1,650	\$913	\$0	\$0		\$2,563
0010700000	LED EXIT SIGN, RETROFIT KIT					11.00	FIXTURE
Unit values	1.00	35.00	27.50	0.00	0.00		62.50
Totals	11.00	\$385	\$303	\$0	\$0		\$688

03-Feb-95

MeansData for Lotus

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=====
Line #      Description
-----
      Manhours  Matl    Labor  Equipment  Sub    Total
=====
U00          371   $11,458   $10,159         $0        $0   $21,617

ESTIMATE TOTAL      371   $11,458   $10,159         $0        $0   $21,617

SALES TAX           5.00%       $573
MATL MARKUP         0.00%        $0
LABOR MARKUP        0.00%           $0
EQUIPT MARKUP       0.00%           $0
SUB MARKUP          0.00%           $0

TOTAL BEFORE CONTINGENC $12,031   $10,159         $0        $0   $22,190
CONTINGENCY           5.00%           $1,109
BOND                  5.00%           $1,109
PROFIT                10.00%          $2,219

JOB TOTAL                                     $26,628

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=====
Estimate:      LIGHTING UPGRADE   Date:      FEBRUARY 2, 1995
Description:   LIGHTING PRODUCT UPGRADE
Project:       HANGAR LIGHTING   Bid Date:  FEBRUARY 2, 1995
Location:      BLDG9647          Job #:      94013.04
Sq. footage:   City indx:Raleigh, NC
=====

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SUMMARY

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-----
Manhours  Matl  Labor  Equipment  Sub  Total
=====
U00              371  $11,458  $10,159          $0      $0  $21,617
TOTAL              371  $11,458  $10,159          $0      $0  $21,617

SALES TAX          5.00%      $573
MATL MARKUP        0.00%      $0
LABOR MARKUP       0.00%          $0
EQUIPT MARKUP      0.00%          $0
SUB MARKUP         0.00%          $0

TOTAL BEFORE CONTINGENC  $12,031  $10,159          $0      $0  $22,190
CONTINGENCY          5.00%          $1,109
BOND                 5.00%          $1,109
PROFIT              10.00%          $2,219

JOB TOTAL                                $26,628

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=====
Estimate:      BLDG 9647          Date:      FEBRUARY 2, 1995
Description:    CONVENTIONAL SKYLIGHT & CONTROLS
Project:        HANGAR STUDY      Bid Date:   FEBRUARY 2, 1995
Location:       BLDG 9647         Job #:     94013.04
Sq. footage:    City indx:Raleigh, NC
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Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0060000001	CONVENTIONAL SKYLIGHT WITH 4" INSULATED CURBS (DOUBLE PANED)						
Unit values		0.00	19.56	2.41	0.09	0.00	22.06
Totals		0.00	\$15,257	\$1,880	\$70	\$0	\$17,207
U00		0	\$15,257	\$1,880	\$70	\$0	\$17,207

Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1611350023	LOW VOLTAGE WIRE #18-4C					
Unit values	1.23	15.40	34.00	0.00	14.00 CLF	49.40
Totals	17.22	\$216	\$476	\$0	\$0	\$692
1611750101	LIGHTING CONTACTOR					
Unit values	2.00	137.00	55.00	0.00	6.00 EA.	192.00
Totals	12.00	\$822	\$330	\$0	\$0	\$1,152
1611850101	PHOTO SWITCH 50-500 FC ADJUSTABLE					
Unit values	1.00	290.00	27.50	0.00	4.00 EA.	317.50
Totals	4.00	\$1,160	\$110	\$0	\$0	\$1,270
1611870101	LOW VOLTAGE TRANS 115V-24V					
Unit values	0.67	64.00	18.35	0.00	1.00 EA.	82.35
Totals	0.67	\$64	\$18	\$0	\$0	\$82
1611870102	SWITCHING RELAYS					
Unit values	0.50	11.30	13.75	0.00	8.00 EA.	25.05
Totals	4.00	\$90	\$110	\$0	\$0	\$200
1611950101	1/2" EMT					
Unit values	0.05	0.38	1.29	0.00	500.00 LF	1.67
Totals	25.00	\$190	\$645	\$0	\$0	\$835
U16 ELECTRICAL	63	\$2,542	\$1,689	\$0	\$0	\$4,231


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Line #      Description
-----
      Manhours   Matl    Labor   Equipment   Sub    Total
=====
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ESTIMATE TOTAL	63	\$17,799	\$3,569	\$70	\$0	\$21,438
SALES TAX	5.00%	\$890				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$18,689	\$3,569	\$70	\$0	\$22,328
CONTINGENCY	5.00%					\$1,116
BOND	5.00%					\$1,116
PROFIT	10.00%					\$2,233
JOB TOTAL						\$26,794

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Estimate:      BLDG 9647      Date:      FEBRUARY 2, 1995
Description:   CONVENTIONAL SKYLIGHT & CONTROLS
Project:       HANGAR STUDY   Bid Date:  FEBRUARY 2, 1995
Location:     BLDG 9647      Job #:     94013.04
Sq. footage:   City indx:Raleigh, NC
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SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
U00	0	\$15,257	\$1,880	\$70	\$0	\$17,207
U16 ELECTRICAL	63	\$2,542	\$1,689	\$0	\$0	\$4,231
TOTAL	63	\$17,799	\$3,569	\$70	\$0	\$21,438
SALES TAX	5.00%	\$890				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$18,689	\$3,569	\$70	\$0	\$22,328
CONTINGENCY	5.00%					\$1,116
BOND	5.00%					\$1,116
PROFIT	10.00%					\$2,233
JOB TOTAL						\$26,794

*NON-RECOMMENDED
LIGHTING ANALYSES*

LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 29360

LCCID FY95 (92)

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 29360 NONBAY LIGHTING UPGRADE @ BLDG 2936

FISCAL YEAR 95 DISCRETE PORTION NAME: LIGHTING

ANALYSIS DATE: 02-03-95 ECONOMIC LIFE 10 YEARS PREPARED BY: JAH

1. INVESTMENT

A. CONSTRUCTION COST	\$	69808.		
B. SIOH	\$	3490.		
C. DESIGN COST	\$	3490.		
D. TOTAL COST (1A+1B+1C)	\$	76789.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.		
F. PUBLIC UTILITY COMPANY REBATE	\$	0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$		76789.	

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1993

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	93.	\$ 3239.	8.77	\$ 28403.
B. DIST	\$.00	0.	\$ 0.	9.26	\$ 0.
C. RESID	\$.00	0.	\$ 0.	10.08	\$ 0.
D. NAT G	\$.00	0.	\$ 0.	10.39	\$ 0.
E. COAL	\$.00	0.	\$ 0.	9.39	\$ 0.
F. LPG	\$.00	0.	\$ 0.	8.78	\$ 0.
M. DEMAND SAVINGS			\$ 5495.	8.49	\$ 46653.
N. TOTAL		93.	\$ 8734.		\$ 75055.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$	484.
(1) DISCOUNT FACTOR (TABLE A)	8.49		
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$	4109.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-)(4)
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d. TOTAL	\$	0.		0.
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C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-)(3A2+3Bd4)	\$	4109.
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4. FIRST YEAR DOLLAR SAVINGS 2N3+3A+(3Bd1/(YRS ECONOMIC LIFE))	\$	9218.
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5. SIMPLE PAYBACK PERIOD (1G/4)	8.33 YEARS
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6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C)	\$	79164.
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7. SAVINGS TO INVESTMENT RATIO (SIR)=(6 / 1G)=	1.03
(IF < 1 PROJECT DOES NOT QUALIFY)	

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR):	3.41 %
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FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
16 DECEMBER 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 2936 - HANGAR	ELECTRIC COSTS:	
AREA USE:	ENERGY CHARGE	\$0.03495 PER KWH
HOURS/DAY 12	DEMAND CHARGE	\$9.25 PER KW
DAYS/WEEK 5		

EXISTING FIXTURE DATA		REPLACEMENT FIXTURE DATA	
2 FOOT	2 LAMP U @ 92 W/FIXT = 0 WATTS	2 FOOT	0 2 LAMP U @ 58 W/FIXT = 0 WATTS
4 FOOT		4 FOOT	
94 2 LAMP @	92 W/FIXT = 8,648 WATTS	348 2 LAMP @	58 W/FIXT = 20,184 WATTS
137 3 LAMP @	137 W/FIXT = 0 WATTS	163 3 LAMP @	87 W/FIXT = 14,181 WATTS
163 4 LAMP @	184 W/FIXT = 29,992 WATTS	0 4 LAMP @	118 W/FIXT = 0 WATTS
8 FOOT		8 FOOT	
127 2 LAMP @	144 W/FIXT = 18,288 WATTS	0 2 LAMP @	125 W/FIXT = 0 WATTS
BASELINE ENERGY CONSUMPTION		ECO ENERGY CONSUMPTION	
177,615 KWH/YR		107,219 KWH/YR	
BASELINE DEMAND		ECO DEMAND	
56.93 KW		34.37 KW	

NET ENERGY SAVINGS	70,397 KWH/YR	NET DEMAND SAVINGS	\$2,504 /YR
		NET DOLLAR SAVINGS	\$4,965 /YR

MAINTENANCE SAVINGS

163 LAMPS @ \$5.00	/ 20,000 HOURS *	3,120 HR/YR =	\$127 / YEAR	(4' FLUORESCENT LAMPS)
NET MAINTENANCE SAVINGS			\$127 /YEAR	

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
16 DECEMBER 1994

INTERIOR LIGHTING: LIGHTING REPLACEMENT

BUILDING #: 2936 - HANGAR
AREA USE: _____
HOURS/DAY: 12
DAYS/WEEK: 7
PEAK USE: 0 (1-YES, 0-NO)

ELECTRIC COSTS:
ENERGY CHARGE \$0.03495 PER KWH
DEMAND CHARGE \$9.25 PER KW

EXISTING FIXTURE DATA

INCAND @ _____ WATTS = 0 WATTS
QUARTZ @ _____ WATTS = 0 WATTS
QUARTZ @ _____ WATTS = 0 WATTS
2 MV @ 450 WATTS = 900 WATTS
MV @ _____ WATTS = 0 WATTS

REPLACEMENT FIXTURE DATA

0 MH @ _____ WATTS = 0 WATTS
0 MH @ _____ WATTS = 0 WATTS
0 MH @ _____ WATTS = 0 WATTS
2 HPS @ 250 WATTS = 500 WATTS
0 HPS @ _____ WATTS = 0 WATTS

BASELINE ENERGY CONSUMPTION 3,931 KWH/YR ECO ENERGY CONSUMPTION 2,184 KWH/YR

BASELINE DEMAND 0.90 KW ECO DEMAND 0.50 KW

NET ENERGY SAVINGS 1,747 KWH/YR
NET DEMAND SAVINGS \$0 /YR
NET DOLLAR SAVINGS \$61 /YR

MAINTENANCE SAVINGS

2 LAMPS @ \$50.00 / 16,000 HOURS * 4,380 HR/YR = \$27 / YEAR (MERCURY VAPOR)
2 LAMPS @ \$38.00 / 24,000 HOURS * 4,380 HR/YR = \$14 / YEAR (HIGH PRESSURE SODIUM)
NET MAINTENANCE SAVINGS \$13 / YEAR

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
16 DECEMBER 1994

INTERIOR LIGHTING: EXIT SIGN REPLACEMENT

BUILDING #: 2936 - HANGAR

ELECTRIC COSTS:
ENERGY CHARGE \$0.03495 PER KWH
DEMAND CHARGE \$9.25 PER KW

INCANDESCENT EXIT SIGNS	FLUORESCENT EXIT SIGNS	REPLACEMENT SIGNS
# OF EXIT SIGNS: 11	# OF EXIT SIGNS: 0	# OF EXIT SIGNS: 11
WATTAGE: 30	WATTAGE: 18	WATTAGE: 3
BASELINE ENERGY CONSUMPTION	2,891 KWH/YR	ECO ENERGY CONSUMPTION
		289 KWH/YR
BASELINE DEMAND	0.33 KW	ECO DEMAND
		0.03 KW

NET ENERGY SAVINGS	2,602 KWH/YR	NET DEMAND SAVINGS	\$33 /YR
		NET DOLLAR SAVINGS	\$124 /YR

MAINTENANCE SAVINGS

11 LAMPS @ \$3.50 / 1,000 HOURS *	8,760 HR/YR =	\$337 / YEAR	(INCANDESCENT)
0 LAMPS @	HR/YR =	\$0 / YEAR	(COMPACT FLUORESCENT)

NET MAINTENANCE SAVINGS \$337 /YEAR

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Estimate:      LIGHTING UPGRADE   Date:      FEBRUARY 2, 1995
Description:    LIGHTING PRODUCT UPGRADE
Project:        HANGAR LIGHTING   Bid Date:  FEBRUARY 2, 1995
Location:       BLDG 2936         Job #:     94013.04
Sq. footage:    City indx:Raleigh, NC
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Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0002000000	DEMOLITION, 2X4 FLUORESCENT FIXTURES					184.00	FIXTURE
Unit values	0.49	0.00	13.35	0.00	0.00		13.35
Totals	90.16	\$0	\$2,456	\$0	\$0		\$2,456
0002010000	DEMOLITION, INCANDESCENT FIXTURES/EXIT SIGNS					11.00	FIXTURE
Unit values	0.26	0.00	7.10	0.00	0.00		7.10
Totals	2.86	\$0	\$78	\$0	\$0		\$78
0002020000	DEMOLITION, 1X4 FLUORESCENT FIXTURES					200.00	FIXTURE
Unit values	0.49	0.00	13.35	0.00	0.00		13.35
Totals	98.00	\$0	\$2,670	\$0	\$0		\$2,670
0010000000	1X4 2-32 WATT FLUORESCENT LAMPS, SURFACE MOUNTED					13.00	FIXTURE
Unit values	1.14	60.00	31.50	0.00	0.00		91.50
Totals	14.82	\$780	\$410	\$0	\$0		\$1,190
0010100000	2X4 2-32 WATT FLUORESCENT LAMPS, RECESSED MOUNTED					21.00	FIXTURE
Unit values	1.51	59.00	41.50	0.00	0.00		100.50
Totals	31.71	\$1,239	\$872	\$0	\$0		\$2,111
0010200000	1X4 2-32 WATT FLUORESCENT LAMPS, RECESSED MOUNTED					45.00	FIXTURE
Unit values	1.14	51.00	31.50	0.00	0.00		82.50
Totals	51.30	\$2,295	\$1,418	\$0	\$0		\$3,713
0010300000	1X4 2-32 WATT FLUORESCENT LAMPS, WALL MOUNTED					3.00	FIXTURE
Unit values	1.14	60.00	31.50	0.00	0.00		91.50
Totals	3.42	\$180	\$95	\$0	\$0		\$275
0010400000	1X4 2-32 WATT FLUORESCENT LAMPS, PENDANT MOUNTED					266.00	FIXTURE
Unit values	1.14	39.00	31.50	0.00	0.00		70.50
Totals	303.24	\$10,374	\$8,379	\$0	\$0		\$18,753
0010500000	2X4 2-32 WATT FLUORESCENT LAMPS, RECESSED MOUNTED WITH REFLECTORS					163.00	FIXTURE

Unit values	1.51	75.00	41.50	0.00	0.00	116.50
Totals	246.13	\$12,225	\$6,765	\$0	\$0	\$18,990
0010700000	LED EXIT SIGN, RETROFIT KIT					
Unit values	1.00	35.00	27.50	0.00	11.00	FIXTURE
Totals	11.00	\$385	\$303	\$0	0.00	62.50
					\$0	\$688
0010800000	250 WATT HIGH PRESSURE SODIUM EXTERIOR WALL MOUNTED FIXTURE					
Unit values	2.00	214.00	55.00	0.00	2.00	FIXTURE
Totals	4.00	\$428	\$110	\$0	0.00	269.00
					\$0	\$538
0050000000	ELECTRIC METALLIC TUBING (EMT), 1-1/4" DIAMETER					
Unit values	0.08	1.16	2.20	0.00	100.00	L.F.
Totals	8.00	\$116	\$220	\$0	0.00	3.36
					\$0	\$336
0050100000	CONTACTORS, LIGHTING, 600 VOLT 3 POLE, ELECTRICALLY HELD, 20 AMP					
Unit values	2.00	137.00	55.00	0.00	5.00	EA.
Totals	10.00	\$685	\$275	\$0	0.00	192.00
					\$0	\$960
0050200000	TOGGLE SWITCH, SINGLE POLE, 15 AMP W/ WALL PLATE AND STEEL OUTLET BOX					
Unit values	0.00	7.33	34.08	0.00	15.00	EA.
Totals	0.00	\$110	\$511	\$0	0.00	41.41
					\$0	\$621
0050300000	WIRE, 600 VOLT TYPE THW, COPPER SOLID #12					
Unit values	0.73	7.65	20.00	0.00	100.00	C.L.F.
Totals	72.70	\$765	\$2,000	\$0	0.00	27.65
					\$0	\$2,765
0050400000	GENERAL EQUIPMENT RENTAL, AERIAL LIFT, SCISSOR TYPE, TO 60' HIGH					
Unit values	0.00	0.00	0.00	550.00	1.00	DAY
Totals	0.00	\$0	\$0	\$550	0.00	550.00
					\$0	\$550

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=====
Line #      Description
-----
      Manhours   Matl    Labor   Equipment   Sub    Total
=====
U00          948    $29,582  $26,562    $550        $0    $56,694

ESTIMATE TOTAL    948    $29,582  $26,562    $550        $0    $56,694

SALES TAX        5.00%    $1,479
MATL MARKUP      0.00%        $0
LABOR MARKUP     0.00%                $0
EQUIPT MARKUP    0.00%                $0
SUB MARKUP       0.00%                $0

TOTAL BEFORE CONTINGENC  $31,061  $26,562    $550        $0    $58,173
CONTINGENCY       5.00%                $2,909
BOND              5.00%                $2,909
PROFIT           10.00%                $5,817

JOB TOTAL                                $69,808
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Estimate:      LIGHTING UPGRADE   Date:      FEBRUARY 2, 1995
Description:   LIGHTING PRODUCT UPGRADE
Project:       HANGAR LIGHTING   Bid Date:  FEBRUARY 2, 1995
Location:     BLDG 2936         Job #:     94013.04
Sq. footage:                               City indx:Raleigh, NC
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SUMMARY

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=====
              Manhours   Matl      Labor    Equipment    Sub      Total
=====
U00              948      $29,582   $26,562      $550          $0      $56,694
TOTAL            948      $29,582   $26,562      $550          $0      $56,694

SALES TAX        5.00%      $1,479
MATL MARKUP      0.00%          $0
LABOR MARKUP     0.00%          $0
EQUIPT MARKUP    0.00%          $0
SUB MARKUP       0.00%          $0

TOTAL BEFORE CONTINGENC $31,061   $26,562      $550          $0      $58,173
CONTINGENCY       5.00%          $2,909
BOND              5.00%          $2,909
PROFIT           10.00%          $5,817

JOB TOTAL                                $69,808

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LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 30070

LCCID FY95 (92)

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 3007H NONBAY LIGHTING UPGRADE @ BLDG 3007

FISCAL YEAR 95 DISCRETE PORTION NAME: LIGHTING

ANALYSIS DATE: 02-03-95 ECONOMIC LIFE 10 YEARS PREPARED BY: JAH

1. INVESTMENT

A. CONSTRUCTION COST	\$	26016.		
B. SIOH	\$	1301.		
C. DESIGN COST	\$	1301.		
D. TOTAL COST (1A+1B+1C)	\$	28618.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.		
F. PUBLIC UTILITY COMPANY REBATE	\$	0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$			28618.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1993

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	29.	\$ 1008.	8.77	\$ 8844.
B. DIST	\$.00	0.	\$ 0.	9.26	\$ 0.
C. RESID	\$.00	0.	\$ 0.	10.08	\$ 0.
D. NAT G	\$.00	0.	\$ 0.	10.39	\$ 0.
E. COAL	\$.00	0.	\$ 0.	9.39	\$ 0.
F. LPG	\$.00	0.	\$ 0.	8.78	\$ 0.
M. DEMAND SAVINGS			\$ 934.	8.49	\$ 7930.
N. TOTAL		29.	\$ 1942.		\$ 16773.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$	553.
(1) DISCOUNT FACTOR (TABLE A)	8.49		
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$	4695.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-)(4)
------	------------------------------	-----------------	------------------------	---

d. TOTAL	\$	0.		0.
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C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-)(3A2+3Bd4)	\$	4695.
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4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS\ ECONOMIC\ LIFE))$	\$	2495.
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5. SIMPLE PAYBACK PERIOD (1G/4)	11.47 YEARS
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6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C)	\$	21468.
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7. SAVINGS TO INVESTMENT RATIO (SIR)=(6 / 1G)=	.75
(IF < 1 PROJECT DOES NOT QUALIFY)	

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR):	.18 %
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FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
16 DECEMBER 1994

INTERIOR LIGHTING: FLUORESCENT FIXTURE REPLACEMENT

BUILDING #: 3007 - HANGAR

ELECTRIC COSTS:
ENERGY CHARGE \$0.03495 PER KWH
DEMAND CHARGE \$9.25 PER KW

AREA USE:
HOURS/DAY 12
DAYS/WEEK 5

EXISTING FIXTURE DATA

2 FOOT 2 LAMP U @ 92 W/FIXT = 0 WATTS

4 FOOT

2 1 LAMP @ 45 W/FIXT = 90 WATTS

137 2 LAMP @ 92 W/FIXT = 12,604 WATTS

39 3 LAMP @ 137 W/FIXT = 5,343 WATTS

2 4 LAMP @ 184 W/FIXT = 368 WATTS

8 FOOT 2 LAMP @ 144 W/FIXT = 0 WATTS

REPLACEMENT FIXTURE DATA

2 FOOT 0 2 LAMP U @ 58 W/FIXT = 0 WATTS

4 FOOT

2 1 LAMP @ 32 W/FIXT = 64 WATTS

176 2 LAMP @ 58 W/FIXT = 10,208 WATTS

2 3 LAMP @ 87 W/FIXT = 174 WATTS

4 LAMP @ 118 W/FIXT = 0 WATTS

8 FOOT 0 2 LAMP @ 125 W/FIXT = 0 WATTS

BASELINE ENERGY CONSUMPTION 57,424 KWH/YR ECO ENERGY CONSUMPTION 32,592 KWH/YR

BASELINE DEMAND 18.41 KW ECO DEMAND 10.45 KW

NET ENERGY SAVINGS

24,832 KWH/YR

NET DEMAND SAVINGS

\$883 /YR

NET DOLLAR SAVINGS

\$1,751 /YR

MAINTENANCE SAVINGS

41 LAMPS @ \$5.00 / 20,000 HOURS * 3,120 HRYR = \$32 / YEAR (4' FLUORESCENT LAMPS)

NET MAINTENANCE SAVINGS

\$32 /YEAR

FORT BRAGG LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD

ECO 1: INTERIOR / EXTERIOR LIGHTING
16 DECEMBER 1994

INTERIOR LIGHTING: EXIT SIGN REPLACEMENT

BUILDING #: 3007 - HANGAR

ELECTRIC COSTS:
ENERGY CHARGE \$0.03495 PER KWH
DEMAND CHARGE \$9.25 PER KW

INCANDESCENT EXIT SIGNS	FLUORESCENT EXIT SIGNS	REPLACEMENT SIGNS
# OF EXIT SIGNS: 17	# OF EXIT SIGNS: 0	# OF EXIT SIGNS: 17
WATTAGE: 30	WATTAGE: 18	WATTAGE: 3
BASELINE ENERGY CONSUMPTION	4,468 KWH/YR	ECO ENERGY CONSUMPTION
BASELINE DEMAND	0.51 KW	ECO DEMAND
		447 KWH/YR
		0.05 KW

NET ENERGY SAVINGS	4,021 KWH/YR	NET DEMAND SAVINGS	\$51 /YR
		NET DOLLAR SAVINGS	\$191 /YR

MAINTENANCE SAVINGS

17 LAMPS @ \$3.50 / 1,000 HOURS *	8,760 HRYR =	\$521 / YEAR	(INCANDESCENT)
LAMPS @ / 10,000 HOURS *	HR/YR =	\$0 / YEAR	(COMPACT FLUORESCENT)
NET MAINTENANCE SAVINGS		\$521 / YEAR	

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Estimate:      LIGHTING UPGRADE   Date:      FEBRUARY 2, 1995
Description:   LIGHTING PRODUCT UPGRADE
Project:       HANGAR LIGHTING   Bid Date:  FEBRUARY 2, 1995
Location:      BLDG 3007         Job #:     94013.04
Sq. footage:   City indx:Raleigh, NC
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Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0002000000	DEMOLITION, 2X4 FLUORESCENT FIXTURES					145.00	FIXTURE
Unit values	0.49	0.00	13.35	0.00	0.00		13.35
Totals	71.05	\$0	\$1,936	\$0	\$0		\$1,936
0002010000	DEMOLITION, INCANDESCENT FIXTURES/EXIT SIGNS					17.00	FIXTURE
Unit values	0.26	0.00	7.10	0.00	0.00		7.10
Totals	4.42	\$0	\$121	\$0	\$0		\$121
0002020000	DEMOLITION, 1X4 FLUORESCENT FIXTURES					33.00	FIXTURE
Unit values	0.49	0.00	13.35	0.00	0.00		13.35
Totals	16.17	\$0	\$441	\$0	\$0		\$441
0010100000	2X4 2-32 WATT FLUORESCENT LAMPS, RECESSED MOUNTED					104.00	FIXTURE
Unit values	1.51	59.00	41.50	0.00	0.00		100.50
Totals	157.04	\$6,136	\$4,316	\$0	\$0		\$10,452
0010400000	1X4 2-32 WATT FLUORESCENT LAMPS, PENDANT MOUNTED					33.00	FIXTURE
Unit values	1.14	39.00	31.50	0.00	0.00		70.50
Totals	37.62	\$1,287	\$1,040	\$0	\$0		\$2,327
0010500000	2X4 2-32 WATT FLUORESCENT LAMPS, RECESSED MOUNTED WITH REFLECTORS					39.00	FIXTURE
Unit values	1.51	75.00	41.50	0.00	0.00		116.50
Totals	58.89	\$2,925	\$1,619	\$0	\$0		\$4,544
0010700000	LED EXIT SIGN, RETROFIT KIT					17.00	FIXTURE
Unit values	1.00	35.00	27.50	0.00	0.00		62.50
Totals	17.00	\$595	\$468	\$0	\$0		\$1,063
0011400000	2X4 3-32 WATT FLUORESCENT LAMPS, SURFACE MOUNTED WITH REFLECTOR					2.00	FIXTURE
Unit values	1.51	79.00	41.50	0.00	0.00		120.50
Totals	3.02	\$158	\$83	\$0	\$0		\$241

03-Feb-95

MeansData for Lotus

Page 2


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=====
Line #      Description
-----
      Manhours  Matl    Labor  Equipment  Sub    Total
=====
U00          366   $11,101  $10,024      $0      $0   $21,125

ESTIMATE TOTAL    366   $11,101  $10,024      $0      $0   $21,125

SALES TAX         5.00%      $555
MATL MARKUP       0.00%      $0
LABOR MARKUP      0.00%      $0
EQUIPT MARKUP     0.00%      $0
SUB MARKUP        0.00%      $0

TOTAL BEFORE CONTINGENC  $11,656  $10,024      $0      $0   $21,680
CONTINGENCY        5.00%      $1,084
BOND               5.00%      $1,084
PROFIT            10.00%      $2,168

JOB TOTAL                                $26,016
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Estimate:      LIGHTING UPGRADE   Date:      FEBRUARY 2, 1995
Description:    LIGHTING PRODUCT UPGRADE
Project:       HANGAR LIGHTING   Bid Date:  FEBRUARY 2, 1995
Location:      BLDG 3007         Job #:     94013.04
Sq. footage:   City indx:Raleigh, NC
=====

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SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
U00	366	\$11,101	\$10,024	\$0	\$0	\$21,125
TOTAL	366	\$11,101	\$10,024	\$0	\$0	\$21,125
SALES TAX	5.00%	\$555				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$11,656	\$10,024	\$0	\$0	\$21,680
CONTINGENCY	5.00%					\$1,084
BOND	5.00%					\$1,084
PROFIT	10.00%					\$2,168
JOB TOTAL						\$26,016

7 ECOS- 2, 3, & 4 ENERGY CALCULATIONS

LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD, FT. BRAGG, NC

This section contains the baseline energy calculations and energy calculations for ECOs 2, 3, and 4. The calculations were performed using the DOE Building Simulation program. The DOE program simulates a building's annual energy performance by modeling all energy consuming systems within that building. Heating and cooling loads are calculated on an hourly basis using local weather data. The user inputs criteria such as building envelope materials, lighting and occupant loading, HVAC equipment type and zoning. Details of the user input data and assumptions in the simulations can be found in *Section 5.3* of the report. The output from these simulations is contained in this section and is sorted by building. Within each building, the output is sorted in the following order: Baseline, ECO-2, ECO- 3, ECO-4.

LCCA AND COST ESTIMATES: (sorted by building)

2936	7-2
3007	7-6
3262	7-9
3354	7-13
3637	7-17
3642	7-21
3807	7-25
3954	7-28
3962	7-31
4137	7-35
4242	7-39
7937	7-43
8944	7-46
9647	7-49

ENERGY TYPE		
IN SITE MBTU - ELECTRICITY FUEL-OIL		
CATEGORY OF USE		
SPACE HEAT	288.05	7113.39
SPACE COOL	643.87	0.00
HVAC AUX	650.92	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	1096.88	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	163.37	0.00
	-----	-----
TOTAL	2843.08	7113.39

TOTAL SITE ENERGY	9956.53 MBTU	157.5 KBTU/SQFT-YR GROSS-AREA	157.5 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	15651.33 MBTU	247.5 KBTU/SQFT-YR GROSS-AREA	247.5 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 41.9
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.2

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE		
IN SITE MBTU -	ELECTRICITY	NATURAL-GAS
CATEGORY OF USE		
SPACE HEAT	173.17	3746.78
SPACE COOL	643.88	0.00
HVAC AUX	634.68	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	1096.88	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	163.37	0.00
	-----	-----
TOTAL	2711.98	3746.78

TOTAL SITE ENERGY	6458.80 MBTU	102.1 KBTU/SQFT-YR GROSS-AREA	102.1 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	11890.99 MBTU	188.1 KBTU/SQFT-YR GROSS-AREA	188.1 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.0
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.2

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE		
IN SITE MBTU -	ELECTRICITY	FUEL-OIL
CATEGORY OF USE		
SPACE HEAT	2035.53	205.77
SPACE COOL	643.88	0.00
HVAC AUX	557.27	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	1096.88	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	163.37	0.00
	-----	-----
TOTAL	4496.93	205.77

TOTAL SITE ENERGY	4702.74 MBTU	74.4 KBTU/SQFT-YR GROSS-AREA	74.4 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	13710.19 MBTU	216.8 KBTU/SQFT-YR GROSS-AREA	216.8 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 20.2

PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.2

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

FT BRAGG ENERGY STUDY

SIMMONS ARMY AIRFIELD

DOE-2.1C 12/ 8/1994 11:34:24 PDL RUN 1

GAR 2936

ECO-4

HVAC RENOVATIONS

REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE

WEATHER FILE- TMY RALEIGH, NC

ENERGY TYPE		
IN SITE MBTU -	ELECTRICITY	FUEL-OIL
CATEGORY OF USE		
SPACE HEAT	287.90	7109.63
SPACE COOL	488.41	0.00
HVAC AUX	511.10	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	1096.88	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	163.37	0.00
	-----	-----
TOTAL	2547.67	7109.63

TOTAL SITE ENERGY	9657.38 MBTU	152.7 KBTU/SQFT-YR GROSS-AREA	152.7 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	14760.54 MBTU	233.4 KBTU/SQFT-YR GROSS-AREA	233.4 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 41.9

PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.1

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE		
IN SITE MBTU -	ELECTRICITY	FUEL-OIL
CATEGORY OF USE		
SPACE HEAT	271.56	7794.15
SPACE COOL	184.35	0.00
HVAC AUX	496.89	0.00
DOM HOT WTR	0.00	231.98
AUX SOLAR	0.00	0.00
LIGHTS	1082.79	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	218.58	0.00
	-----	-----
TOTAL	2254.17	8026.13

TOTAL SITE ENERGY	10280.29 MBTU	205.1 KBTU/SQFT-YR GROSS-AREA	205.1 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	14795.40 MBTU	295.1 KBTU/SQFT-YR GROSS-AREA	295.1 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 69.2
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

3007ECO2.SIM
FT BRAGG ENERGY STUDY
HANGAR 3007
PORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE

12/2/94

Page 1
SIMMONS ARMY AIRFIELD
ECO-2

DOE-2.1C 12/ 2/1994 12:17:49 PDL RUN 1
NG BOILERS & INFRA-RED RADIANT HEAT
WEATHER FILE- TMY RALEIGH, NC

ENERGY TYPE
IN SITE MBTU - ELECTRICITY NATURAL-GAS

CATEGORY OF USE

SPACE HEAT	211.44	4598.27
SPACE COOL	184.35	0.00
HVAC AUX	482.10	0.00
DOM HOT WTR	4.38	81.61
AUX SOLAR	0.00	0.00
LIGHTS	1082.79	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	218.58	0.00
	-----	-----
TOTAL	2183.64	4679.88

TOTAL SITE ENERGY	6863.52 MBTU	136.9 KBTU/SQFT-YR GROSS-AREA	136.9 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	11237.35 MBTU	224.2 KBTU/SQFT-YR GROSS-AREA	224.2 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 63.4
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE		
IN SITE MBTU -		
	ELECTRICITY	FUEL-OIL
CATEGORY OF USE		
SPACE HEAT	1375.52	1278.74
SPACE COOL	184.35	0.00
HVAC AUX	394.54	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	1082.80	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	218.58	0.00
	-----	-----
TOTAL	3255.78	1278.74

TOTAL SITE ENERGY	4534.49 MBTU	90.4 KBTU/SQFT-YR GROSS-AREA	90.4 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	11055.77 MBTU	220.5 KBTU/SQFT-YR GROSS-AREA	220.5 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 63.4
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE		
IN SITE MBTU -	ELECTRICITY	FUEL-OIL
CATEGORY OF USE		
SPACE HEAT	192.19	11447.33
SPACE COOL	366.32	0.00
HVAC AUX	671.63	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	1096.89	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	185.21	0.00
	-----	-----
TOTAL	2512.24	11447.33

TOTAL SITE ENERGY	13959.52 MBTU	224.1 KBTU/SQFT-YR GROSS-AREA	224.1 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	18991.77 MBTU	304.9 KBTU/SQFT-YR GROSS-AREA	304.9 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 38.7
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 24.6

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE		
IN SITE MBTU -	ELECTRICITY	NATURAL-GAS
CATEGORY OF USE		
SPACE HEAT	192.19	9128.09
SPACE COOL	366.32	0.00
HVAC AUX	597.94	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	1096.90	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	185.21	0.00
	-----	-----
TOTAL	2438.57	9128.09

TOTAL SITE ENERGY	11566.79 MBTU	185.7 KBTU/SQFT-YR GROSS-AREA	185.7 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	16451.44 MBTU	264.2 KBTU/SQFT-YR GROSS-AREA	264.2 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 11.9
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 13.2

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE		
IN SITE MBTU - ELECTRICITY FUEL-OIL		
CATEGORY OF USE		
SPACE HEAT	3384.29	4542.27
SPACE COOL	366.32	0.00
HVAC AUX	447.43	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	1096.89	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	185.21	0.00
	-----	-----
TOTAL	5480.14	4542.27

TOTAL SITE ENERGY	10022.43 MBTU	160.9 KBTU/SQFT-YR GROSS-AREA	160.9 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	20999.23 MBTU	337.2 KBTU/SQFT-YR GROSS-AREA	337.2 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 37.4
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

FT BRAGG ENERGY STUDY

SIMMONS ARMY AIRFIELD

DOE-2.1C 12/ 8/1994 13:47: 9 PDL RUN 1

GAR 3262

ECO-4

VAV RETROFIT

REPORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE

WEATHER FILE- TMY RALEIGH, NC

ENERGY TYPE IN SITE MBTU -	ELECTRICITY	FUEL-OIL
CATEGORY OF USE		
SPACE HEAT	189.66	9387.93
SPACE COOL	508.57	0.00
HVAC AUX	754.43	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	1096.89	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	185.21	0.00
	-----	-----
TOTAL	2734.76	9387.93

TOTAL SITE ENERGY	12122.82 MBTU	194.7 KBTU/SQFT-YR GROSS-AREA	194.7 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	17600.77 MBTU	282.6 KBTU/SQFT-YR GROSS-AREA	282.6 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 37.4

PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 10.4

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE		
IN SITE MBTU - ELECTRICITY FUEL-OIL		
CATEGORY OF USE		
SPACE HEAT	312.76	4593.35
SPACE COOL	224.21	0.00
HVAC AUX	83.28	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	572.26	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	111.01	0.00
	-----	-----
TOTAL	1303.52	4593.35

TOTAL SITE ENERGY	5896.84 MBTU	177.8 KBTU/SQFT-YR GROSS-AREA	177.8 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	8507.73 MBTU	256.6 KBTU/SQFT-YR GROSS-AREA	256.6 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 14.9
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE		
IN SITE MBTU - ELECTRICITY NATURAL-GAS		
CATEGORY OF USE		
SPACE HEAT	419.17	2865.93
SPACE COOL	224.21	0.00
HVAC AUX	80.35	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	572.26	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	111.01	0.00
	-----	-----
TOTAL	1407.01	2865.93

TOTAL SITE ENERGY	4272.90 MBTU	128.9 KBTU/SQFT-YR GROSS-AREA	128.9 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	7091.07 MBTU	213.8 KBTU/SQFT-YR GROSS-AREA	213.8 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 7.8
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE		
IN SITE MBTU - ELECTRICITY FUEL-OIL		
CATEGORY OF USE		
SPACE HEAT	797.95	1766.66
SPACE COOL	224.21	0.00
HVAC AUX	41.89	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	572.26	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	111.01	0.00
	-----	-----
TOTAL	1747.32	1766.66

TOTAL SITE ENERGY	3513.95 MBTU	106.0 KBTU/SQFT-YR GROSS-AREA	106.0 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	7013.78 MBTU	211.5 KBTU/SQFT-YR GROSS-AREA	211.5 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 7.8

PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE IN SITE MBTU -	ELECTRICITY	FUEL-OIL
CATEGORY OF USE		
SPACE HEAT	176.96	4849.53
SPACE COOL	121.67	0.00
HVAC AUX	107.51	0.00
DON HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	572.27	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	111.01	0.00
	-----	-----
TOTAL	1089.42	4849.53

TOTAL SITE ENERGY	5938.91 MBTU	179.1 KBTU/SQFT-YR GROSS-AREA	179.1 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	8120.93 MBTU	244.9 KBTU/SQFT-YR GROSS-AREA	244.9 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 14.8

PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE		
IN SITE MBTU -	ELECTRICITY	FUEL-OIL
CATEGORY OF USE		
SPACE HEAT	158.60	3567.65
SPACE COOL	96.80	0.00
HVAC AUX	60.15	0.00
DOW HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	357.33	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	264.61	0.00
	-----	-----
TOTAL	937.50	3567.65

TOTAL SITE ENERGY	4505.13 MBTU	240.3 KBTU/SQFT-YR GROSS-AREA	240.3 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	6382.91 MBTU	340.4 KBTU/SQFT-YR GROSS-AREA	340.4 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 97.3
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

PORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE

ENERGY TYPE		
IN SITE MBTU -	ELECTRICITY	NATURAL-GAS
CATEGORY OF USE		
SPACE HEAT	111.85	1959.77
SPACE COOL	66.41	0.00
HVAC AUX	45.22	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	357.33	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	264.61	0.00
	-----	-----
TOTAL	845.42	1959.77

TOTAL SITE ENERGY	2907.91 MBTU	155.1 KBTU/SQFT-YR GROSS-AREA	155.1 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	4807.03 MBTU	256.4 KBTU/SQFT-YR GROSS-AREA	256.4 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 97.3
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE		
IN SITE MBTU -	ELECTRICITY	FUEL-OIL
CATEGORY OF USE		
SPACE HEAT	622.87	553.78
SPACE COOL	88.97	0.00
HVAC AUX	11.14	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	357.33	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	264.61	0.00
	-----	-----
TOTAL	1344.92	553.78

TOTAL SITE ENERGY	1898.70 MBTU	101.3 KBTU/SQFT-YR GROSS-AREA	101.3 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	4592.57 MBTU	245.0 KBTU/SQFT-YR GROSS-AREA	245.0 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 97.3
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE IN SITE MBTU -	ELECTRICITY	FUEL-OIL
CATEGORY OF USE		
SPACE HEAT	147.82	3132.05
SPACE COOL	170.92	0.00
HVAC AUX	202.94	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	357.33	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	264.61	0.00
	-----	-----
TOTAL	1143.62	3132.05

TOTAL SITE ENERGY	4275.65 MBTU	228.0 KBTU/SQFT-YR GROSS-AREA	228.0 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	6566.31 MBTU	350.2 KBTU/SQFT-YR GROSS-AREA	350.2 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 97.3

PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE		
IN SITE MBTU -	ELECTRICITY	FUEL-OIL
CATEGORY OF USE		
SPACE HEAT	277.43	5031.04
SPACE COOL	223.90	0.00
HVAC AUX	79.12	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	590.91	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	113.89	0.00
	-----	-----
TOTAL	1285.25	5031.04

TOTAL SITE ENERGY	6316.26 MBTU	190.5 KBTU/SQFT-YR GROSS-AREA	190.5 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	8890.57 MBTU	268.1 KBTU/SQFT-YR GROSS-AREA	268.1 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 35.3
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

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RT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE

ENERGY TYPE IN SITE MBTU -	ELECTRICITY	NATURAL-GAS
CATEGORY OF USE		
SPACE HEAT	250.36	3475.99
SPACE COOL	223.90	0.00
HVAC AUX	84.10	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	590.91	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	113.89	0.00
	-----	-----
TOTAL	1263.16	3475.99

TOTAL SITE ENERGY	4739.13 MBTU	142.9 KBTU/SQFT-YR GROSS-AREA	142.9 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	7269.20 MBTU	219.2 KBTU/SQFT-YR GROSS-AREA	219.2 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 4.8
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE IN SITE MBTU -	ELECTRICITY	FUEL-OIL
CATEGORY OF USE		
SPACE HEAT	1040.49	1547.21
SPACE COOL	223.90	0.00
HVAC AUX	32.46	0.00
DCH HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	590.92	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	113.89	0.00
	-----	-----
TOTAL	2001.66	1547.21

TOTAL SITE ENERGY	3548.84 MBTU	107.0 KBTU/SQFT-YR GROSS-AREA	107.0 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	7558.10 MBTU	227.9 KBTU/SQFT-YR GROSS-AREA	227.9 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 24.9

PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE		
IN SITE MBTU - ELECTRICITY FUEL-OIL		
CATEGORY OF USE		
SPACE HEAT	180.12	5244.23
SPACE COOL	122.07	0.00
HVAC AUX	109.31	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	590.92	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	113.89	0.00
	-----	-----
TOTAL	1116.31	5244.23

TOTAL SITE ENERGY	6360.52 MBTU	191.8 KBTU/SQFT-YR GROSS-AREA	191.8 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	8596.43 MBTU	259.2 KBTU/SQFT-YR GROSS-AREA	259.2 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 35.3

PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE		
IN SITE MBTU -	ELECTRICITY	FUEL-OIL
CATEGORY OF USE		
SPACE HEAT	273.34	7961.02
SPACE COOL	0.00	0.00
HVAC AUX	556.73	0.00
DOM HOT WTR	0.00	231.98
AUX SOLAR	0.00	0.00
LIGHTS	1132.43	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	178.32	0.00
	-----	-----
TOTAL	2140.83	8192.99

TOTAL SITE ENERGY	10333.85 MBTU	197.3 KBTU/SQFT-YR GROSS-AREA	197.3 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	14621.99 MBTU	279.2 KBTU/SQFT-YR GROSS-AREA	279.2 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 78.6
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE		
IN SITE MBTU - ELECTRICITY NATURAL-GAS		
CATEGORY OF USE		
SPACE HEAT	217.80	4825.14
SPACE COOL	0.00	0.00
HVAC AUX	543.14	0.00
DOM HOT WTR	4.36	81.51
AUX SOLAR	0.00	0.00
LIGHTS	1132.41	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	178.32	0.00
	-----	-----
TOTAL	2076.03	4906.65

TOTAL SITE ENERGY 6982.74 MBTU 133.3 KBTU/SQFT-YR GROSS-AREA 133.3 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY 11141.16 MBTU 212.7 KBTU/SQFT-YR GROSS-AREA 212.7 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 49.5

PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

PORT- BEPS ESTIMATED BUILDING ENERGY PERFORMANCE

ENERGY TYPE IN SITE MBTU -	ELECTRICITY	FUEL-OIL
CATEGORY OF USE		
SPACE HEAT	1360.14	1313.07
SPACE COOL	0.00	0.00
HVAC AUX	452.23	0.00
DOM HOT WTR	0.00	231.98
AUX SOLAR	0.00	0.00
LIGHTS	1132.43	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	178.32	0.00
	-----	-----
TOTAL	3123.13	1545.04

TOTAL SITE ENERGY	4668.21 MBTU	89.1 KBTU/SQFT-YR GROSS-AREA	89.1 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	10923.93 MBTU	208.6 KBTU/SQFT-YR GROSS-AREA	208.6 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 81.8
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE		
IN SITE MBTU -	ELECTRICITY	FUEL-OIL
CATEGORY OF USE		
SPACE HEAT	159.80	3599.33
SPACE COOL	187.44	0.00
HVAC AUX	80.22	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	634.62	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	188.68	0.00
	-----	-----
TOTAL	1250.76	3599.33

TOTAL SITE ENERGY	4850.10 MBTU	141.1 KBTU/SQFT-YR GROSS-AREA	141.1 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	7355.39 MBTU	214.0 KBTU/SQFT-YR GROSS-AREA	214.0 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 14.8
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE		
IN SITE MBTU - ELECTRICITY NATURAL-GAS		
CATEGORY OF USE		
SPACE HEAT	109.31	2096.87
SPACE COOL	187.44	0.00
HVAC AUX	81.23	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	634.62	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	188.68	0.00
	-----	-----
TOTAL	1201.28	2096.87

TOTAL SITE ENERGY	3298.16 MBTU	95.9 KBTU/SQFT-YR GROSS-AREA	95.9 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	5704.33 MBTU	165.9 KBTU/SQFT-YR GROSS-AREA	165.9 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.0

PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE IN SITE MBTU -	ELECTRICITY	FUEL-OIL
CATEGORY OF USE		
SPACE HEAT	591.75	528.32
SPACE COOL	187.44	0.00
HVAC AUX	39.11	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	634.62	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	188.68	0.00
	-----	-----
TOTAL	1641.60	528.32

TOTAL SITE ENERGY	2169.94 MBTU	63.1 KBTU/SQFT-YR GROSS-AREA	63.1 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	5458.11 MBTU	158.8 KBTU/SQFT-YR GROSS-AREA	158.8 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.7

PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE		
IN SITE MBTU -	ELECTRICITY	FUEL-OIL
CATEGORY OF USE		
SPACE HEAT	238.10	4941.79
SPACE COOL	204.36	0.00
EVAC AUX	71.70	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	607.47	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	109.29	0.00
	-----	-----
TOTAL	1230.92	4941.79

TOTAL SITE ENERGY	6172.69 MBTU	186.1 KBTU/SQFT-YR GROSS-AREA	186.1 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	8638.19 MBTU	260.5 KBTU/SQFT-YR GROSS-AREA	260.5 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 16.7
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE		
IN SITE MBTU - ELECTRICITY NATURAL-GAS		
CATEGORY OF USE		
SPACE HEAT	207.40	3338.74
SPACE COOL	204.36	0.00
HVAC AUX	74.77	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	607.47	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	109.29	0.00
	-----	-----
TOTAL	1203.30	3338.74

TOTAL SITE ENERGY	4542.02 MBTU	137.0 KBTU/SQFT-YR GROSS-AREA	137.0 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	6952.20 MBTU	209.7 KBTU/SQFT-YR GROSS-AREA	209.7 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 7.2
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE		
IN SITE MBTU -	ELECTRICITY	FUEL-OIL
CATEGORY OF USE		
SPACE HEAT	887.74	1688.66
SPACE COOL	204.36	0.00
HVAC AUX	28.06	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	607.47	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	109.29	0.00
	-----	-----
TOTAL	1836.92	1688.66

TOTAL SITE ENERGY	3525.56 MBTU	106.3 KBTU/SQFT-YR GROSS-AREA	106.3 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	7204.89 MBTU	217.3 KBTU/SQFT-YR GROSS-AREA	217.3 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 7.2
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE IN SITE MBTU -	ELECTRICITY	FUEL-OIL
CATEGORY OF USE		
SPACE HEAT	161.86	3667.50
SPACE COOL	336.20	0.00
HVAC AUX	228.34	0.00
DON HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	607.47	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	109.29	0.00
	-----	-----
TOTAL	1443.16	3667.50

TOTAL SITE ENERGY	5110.64 MBTU	154.1 KBTU/SQFT-YR GROSS-AREA	154.1 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	8001.24 MBTU	241.3 KBTU/SQFT-YR GROSS-AREA	241.3 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 16.7

PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE		
IN SITE MBTU - ELECTRICITY FUEL-OIL		
CATEGORY OF USE		
SPACE HEAT	158.57	3575.87
SPACE COOL	99.89	0.00
HVAC AUX	59.76	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	357.33	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	264.61	0.00
	-----	-----
TOTAL	940.16	3575.87

TOTAL SITE ENERGY	4516.01 MBTU	240.9 KBTU/SQFT-YR GROSS-AREA	240.9 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	6399.12 MBTU	341.3 KBTU/SQFT-YR GROSS-AREA	341.3 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 97.3
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE		
IN SITE MBTU - ELECTRICITY NATURAL-GAS		
CATEGORY OF USE		
SPACE HEAT	114.89	1955.24
SPACE COOL	68.81	0.00
HVAC AUX	44.68	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	357.33	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	264.61	0.00
	-----	-----
TOTAL	850.32	1955.24

TOTAL SITE ENERGY 2908.28 MBTU 155.1 KBTU/SQFT-YR GROSS-AREA 155.1 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY 4817.23 MBTU 256.9 KBTU/SQFT-YR GROSS-AREA 256.9 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 97.2

PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE		
IN SITE MBTU - ELECTRICITY FUEL-OIL		
CATEGORY OF USE		
SPACE HEAT	639.26	777.59
SPACE COOL	99.89	0.00
HVAC AUX	14.73	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	357.33	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	264.61	0.00
	-----	-----
TOTAL	1375.82	777.59

TOTAL SITE ENERGY	2304.97 MBTU	122.9 KBTU/SQFT-YR GROSS-AREA	122.9 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	5364.33 MBTU	286.1 KBTU/SQFT-YR GROSS-AREA	286.1 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 97.2
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE		
IN SITE MBTU -	ELECTRICITY	FUEL-OIL
CATEGORY OF USE		
SPACE HEAT	147.34	3121.67
SPACE COOL	173.56	0.00
HVAC AUX	205.10	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	357.33	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	264.61	0.00
	-----	-----
TOTAL	1147.94	3121.67

TOTAL SITE ENERGY	4269.59 MBTU	227.7 KBTU/SQFT-YR GROSS-AREA	227.7 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	6568.87 MBTU	350.4 KBTU/SQFT-YR GROSS-AREA	350.4 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 97.3

PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE		
IN SITE MBTU - ELECTRICITY FUEL-OIL		
CATEGORY OF USE		
SPACE HEAT	120.75	2326.89
SPACE COOL	35.73	0.00
HVAC AUX	39.18	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	218.67	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	103.54	0.00
	-----	-----
TOTAL	517.87	2326.89

TOTAL SITE ENERGY	2844.77 MBTU	257.0 KBTU/SQFT-YR GROSS-AREA	257.0 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	3882.07 MBTU	350.7 KBTU/SQFT-YR GROSS-AREA	350.7 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 37.1
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE		
IN SITE MBTU - ELECTRICITY NATURAL-GAS		
CATEGORY OF USE		
SPACE HEAT	71.60	1269.81
SPACE COOL	35.73	0.00
HVAC AUX	29.41	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	218.67	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	103.54	0.00
	-----	-----
TOTAL	458.95	1269.81

TOTAL SITE ENERGY	1728.77 MBTU	156.2 KBTU/SQFT-YR GROSS-AREA	156.2 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	2648.06 MBTU	239.3 KBTU/SQFT-YR GROSS-AREA	239.3 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 34.8
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE IN SITE MBTU -	ELECTRICITY	FUEL-OIL
CATEGORY OF USE		
SPACE HEAT	66.85	1283.71
SPACE COOL	35.73	0.00
HVAC AUX	27.47	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	218.67	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	103.54	0.00
	-----	-----
TOTAL	452.26	1283.71

TOTAL SITE ENERGY	1735.97 MBTU	156.8 KBTU/SQFT-YR GROSS-AREA	156.8 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	2641.85 MBTU	238.7 KBTU/SQFT-YR GROSS-AREA	238.7 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 34.8

PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE IN SITE MBTU -	ELECTRICITY	FUEL-OIL
CATEGORY OF USE		
SPACE HEAT	102.67	1983.05
SPACE COOL	37.53	0.00
HVAC AUX	59.25	0.00
DOM HOT WTR	0.00	0.00
AUX SOLAR	0.00	0.00
LIGHTS	218.66	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	103.54	0.00
	-----	-----
TOTAL	521.66	1983.05

TOTAL SITE ENERGY	2504.72 MBTU	226.3 KBTU/SQFT-YR GROSS-AREA	226.3 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	3549.62 MBTU	320.7 KBTU/SQFT-YR GROSS-AREA	320.7 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 43.9

PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE		
IN SITE MBTU - ELECTRICITY FUEL-OIL		
CATEGORY OF USE		
SPACE HEAT	320.25	12014.68
SPACE COOL	335.21	0.00
HVAC AUX	603.57	0.00
DOM HOT WTR	0.00	231.98
AUX SOLAR	0.00	0.00
LIGHTS	1254.90	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	190.97	0.00
	-----	-----
TOTAL	2704.89	12246.66

TOTAL SITE ENERGY	14951.49 MBTU	222.0 KBTU/SQFT-YR GROSS-AREA	222.0 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	20369.28 MBTU	302.4 KBTU/SQFT-YR GROSS-AREA	302.4 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 36.9
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 1.9

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE		
IN SITE MBTU -	ELECTRICITY	NATURAL-GAS
CATEGORY OF USE		
SPACE HEAT	304.39	7739.89
SPACE COOL	335.21	0.00
HVAC AUX	515.71	0.00
DOM HOT WTR	0.00	99.88
AUX SOLAR	0.00	0.00
LIGHTS	1254.87	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	190.96	0.00
	-----	-----
TOTAL	2601.15	7839.77

TOTAL SITE ENERGY	10440.90 MBTU	155.0 KBTU/SQFT-YR GROSS-AREA	155.0 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	15650.97 MBTU	232.4 KBTU/SQFT-YR GROSS-AREA	232.4 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 12.4

PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.3

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE		
IN SITE MBTU -	ELECTRICITY	FUEL-OIL
CATEGORY OF USE		
SPACE HEAT	2075.98	3088.13
SPACE COOL	335.21	0.00
HVAC AUX	366.17	0.00
DOM HOT WTR	0.00	231.98
AUX SOLAR	0.00	0.00
LIGHTS	1254.89	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	190.97	0.00
	-----	-----
TOTAL	4223.22	3320.11

TOTAL SITE ENERGY 7543.29 MBTU 112.0 KBTU/SQFT-YR GROSS-AREA 112.0 KBTU/SQFT-YR NET-AREA
 TOTAL SOURCE ENERGY 16002.34 MBTU 237.6 KBTU/SQFT-YR GROSS-AREA 237.6 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 34.6

PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE		
IN SITE MBTU -	ELECTRICITY	FUEL-OIL
CATEGORY OF USE		
SPACE HEAT	314.47	10532.26
SPACE COOL	100.23	0.00
HVAC AUX	404.10	0.00
DOM HOT WTR	0.00	210.41
AUX SOLAR	0.00	0.00
LIGHTS	985.70	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	184.07	0.00
	-----	-----
TOTAL	1988.58	10742.67

TOTAL SITE ENERGY	12731.19 MBTU	228.8 KBTU/SQFT-YR GROSS-AREA	228.8 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	16714.19 MBTU	300.3 KBTU/SQFT-YR GROSS-AREA	300.3 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 13.1
 PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 1.2

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
 ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE		
IN SITE MBTU - ELECTRICITY NATURAL-GAS		
CATEGORY OF USE		
SPACE HEAT	239.01	5457.17
SPACE COOL	100.23	0.00
HVAC AUX	302.22	0.00
DOM HOT WTR	0.00	80.73
AUX SOLAR	0.00	0.00
LIGHTS	985.70	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	184.07	0.00
	-----	-----
TOTAL	1811.24	5537.90

TOTAL SITE ENERGY	7349.07 MBTU	132.1 KBTU/SQFT-YR GROSS-AREA	132.1 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	10976.85 MBTU	197.2 KBTU/SQFT-YR GROSS-AREA	197.2 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 1.0
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.1

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE		
IN SITE MBTU - ELECTRICITY FUEL-OIL		
CATEGORY OF USE		
SPACE HEAT	1657.34	1105.78
SPACE COOL	100.23	0.00
HVAC AUX	174.79	0.00
DOM HOT WTR	0.00	210.41
AUX SOLAR	0.00	0.00
LIGHTS	985.69	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	184.07	0.00
	-----	-----
TOTAL	3102.11	1316.20

TOTAL SITE ENERGY	4418.27 MBTU	79.4 KBTU/SQFT-YR GROSS-AREA	79.4 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	10631.75 MBTU	191.0 KBTU/SQFT-YR GROSS-AREA	191.0 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 2.0
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE IN SITE MBTU -	ELECTRICITY	FUEL-OIL
CATEGORY OF USE		
SPACE HEAT	273.52	7995.96
SPACE COOL	225.12	0.00
HVAC AUX	573.72	0.00
DOM HOT WTR	0.00	231.98
AUX SOLAR	0.00	0.00
LIGHTS	1132.44	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	178.32	0.00
	-----	-----
TOTAL	2383.12	8227.94

TOTAL SITE ENERGY	10611.09 MBTU	202.6 KBTU/SQFT-YR GROSS-AREA	202.6 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	15384.57 MBTU	293.7 KBTU/SQFT-YR GROSS-AREA	293.7 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 54.3
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE
IN SITE MBTU - ELECTRICITY NATURAL-GAS

CATEGORY OF USE

SPACE HEAT	219.50	4845.76
SPACE COOL	225.12	0.00
HVAC AUX	559.05	0.00
DOM HOT WTR	4.35	81.47
AUX SOLAR	0.00	0.00
LIGHTS	1132.43	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	178.32	0.00
	-----	-----
TOTAL	2318.77	4927.23

TOTAL SITE ENERGY	7246.07 MBTU	138.3 KBTU/SQFT-YR GROSS-AREA	138.3 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	11890.72 MBTU	227.0 KBTU/SQFT-YR GROSS-AREA	227.0 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 49.5

PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

ENERGY TYPE IN SITE MBTU -	ELECTRICITY	FUEL-OIL
CATEGORY OF USE		
SPACE HEAT	1399.91	1555.23
SPACE COOL	225.12	0.00
HVAC AUX	470.27	0.00
DOM HOT WTR	0.00	231.98
AUX SOLAR	0.00	0.00
LIGHTS	1132.45	0.00
VERT TRANS	0.00	0.00
MISC EQUIP	178.33	0.00
	-----	-----
TOTAL	3406.07	1787.20

TOTAL SITE ENERGY	5193.30 MBTU	99.1 KBTU/SQFT-YR GROSS-AREA	99.1 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY	12015.74 MBTU	229.4 KBTU/SQFT-YR GROSS-AREA	229.4 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 49.5

PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0

NOTE ELECTRICITY AND/OR FUEL USED TO GENERATE ELECTRICITY IS APPORTIONED BASED
ON THE YEARLY DEMAND. ALL OTHER ENERGY TYPES ARE APPORTIONED HOURLY.

8 ECO - 2 LIFE CYCLE COST ANALYSIS

LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD, FT. BRAGG, NC

This section contains the life-cycle cost analyses and construction cost estimates for ECO-2: Install Natural Gas Boiler and Infrared Heaters. The analyses and estimates are sorted by building number.

LCCA ECO-2A - ALL BUILDINGS 8-2

LCCA ECO-2B - ALL BUILDINGS 8-3

COST ESTIMATE FOR NATURAL GAS LINE EXTENSION 8-4

LCCA AND COST ESTIMATE: (sorted by building)

2936	8-8
3007	8-15
3262	8-22
3354	8-29
3637	8-36
3642	8-43
3807	8-50
3954	8-57
3962	8-64
4137	8-71
4242	8-78
7937	8-85
8944	8-92
9647	8-99

LCCA ECO-2A

All Buildings

LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: ECO2ATOT

LCCID FY95 (92)

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 94013.04 LES: ECO2A - TOTAL FOR ALL BUILDINGS

FISCAL YEAR 95 DISCRETE PORTION NAME: ECO

ANALYSIS DATE: 12-13-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	1599836.	
B. SIOH	\$	79992.	
C. DESIGN COST	\$	79992.	
D. TOTAL COST (1A+1B+1C)	\$	1759820.	
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.	
F. PUBLIC UTILITY COMPANY REBATE	\$	0.	
G. TOTAL INVESTMENT (1D - 1E - 1F)			\$ 1759820.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	270.	\$ 9446.	15.08	\$ 142450.
B. DIST	\$ 19.18	27435.	\$ 526196.	18.57	\$ 9771453.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	-16914.	\$ -227329.	18.58	\$ -4223768.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 0.	14.88	\$ 0.
N. TOTAL		10791.	\$ 308313.		\$ 5690136.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$ 32761.
(1) DISCOUNT FACTOR (TABLE A)	14.88	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$ 487484.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-) (3A2+3Bd4) \$ 487484.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS\ ECONOMIC\ LIFE))$ \$ 341074.

5. SIMPLE PAYBACK PERIOD (1G/4) 5.16 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 6177619.

7. SAVINGS TO INVESTMENT RATIO (SIR) = (6 / 1G) = 3.51
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 9.67 %

LCCA ECO-2B

All Buildings

LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: ECO2B
LCCID: FY95 (92)

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 94013.04 ECO2B-TOTAL (ALL BUILDINGS)

FISCAL YEAR 95 DISCRETE PORTION NAME: ECO2B-TOT

ANALYSIS DATE: 04-21-95 ECONOMIC LIFE 20 YEARS PREPARED BY: LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	2751666.	
B. SIOH	\$	137583.	
C. DESIGN COST	\$	137583.	
D. TOTAL COST (1A+1B+1C)	\$	3026832.	
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.	
F. PUBLIC UTILITY COMPANY REBATE	\$	0.	
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$		3026832.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH (1)	SAVINGS MWH/YR (2)	ANNUAL \$ SAVINGS (3)	DISCOUNT FACTOR (4)	DISCOUNTED SAVINGS (5)
A. ELECT	\$ 34.95	270.	\$ 9437.	15.08	\$ 142302.
B. DIST	\$ 19.18	27435.	\$ 526203.	18.57	\$ 9771595.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	-16914.	\$ -227324.	18.58	\$ -4223683.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 0.	14.88	\$ 0.
N. TOTAL		10791.	\$ 308316.		\$ 5690214.

3. NON ENERGY SAVINGS (+) / COST (-)

A. ANNUAL RECURRING (+/-)

(1) DISCOUNT FACTOR (TABLE A)	14.88	\$ 32761.
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$ 487484.

B. NON RECURRING SAVINGS (+) / COSTS (-)

ITEM	SAVINGS (+) COST (-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS (+) / COST (-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS (+) / COST (-) (3A2+3Bd4) \$ 487484.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS\ ECONOMIC\ LIFE))$ \$ 341077.

5. SIMPLE PAYBACK PERIOD (1G/4) 8.87 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 6177698.

7. SAVINGS TO INVESTMENT RATIO (SIR) = $(6 / 1G) =$ 2.04
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 6.74 %

COST ESTIMATE

for Natural Gas Line Extension

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Estimate:      SIMMONS AAF      Date:      04-Apr-95
Description:    COST ESTIMATE (100% OF REQ'D MAIN - 6" & 4" STEEL)
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG, N.C. Job #:      94013.04
Sq. footage:   MAIN GAS LINE    City indx:Raleigh, NC
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Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0205541750	PAVEMENT REMOVAL, BITUMINOUS, 4" TO 6" THICK					560.00 S.Y.	
Unit values	0.10	0.00	1.73	2.50	0.00		4.23
Totals	53.20	\$0	\$967	\$1,401	\$0		\$2,368
0222541900	TAMPING TRENCH B'FILL, VIBRATING PLATE, ADD					2550.00 C.Y.	
Unit values	0.09	0.00	1.44	0.55	0.00		1.99
Totals	226.95	\$0	\$3,667	\$1,411	\$0		\$5,078
0222582800	TRENCH EXCVTNG 40HP CHNTRNCHR&BKFL 12"W24"D					23000.00 L.F.	
Unit values	0.01	0.00	0.20	0.20	0.00		0.39
Totals	230.00	\$0	\$4,502	\$4,502	\$0		\$9,004
0222700500	HORZ BORNG >100' RRWK .5"WALL 24"DIA CASING					600.00 L.F.	
Unit values	9.14	42.93	165.09	125.10	0.00		333.12
Totals	5485.80	\$25,755	\$99,056	\$75,058	\$0		\$199,869
0251040200	ASPHALTIC CONCRETE PAVEMENT, PAVING, BINDER COURSE, 4" THICK					560.00 S.Y.	
Unit values	0.02	5.30	0.37	0.33	0.00		6.01
Totals	11.76	\$2,969	\$210	\$186	\$0		\$3,365
0251040380	ASPHALTIC CONCRETE PAVEMENT, PAVING, WEARING COURSE, 2" THICK					560.00 S.Y.	
Unit values	0.02	2.96	0.27	0.25	0.00		3.48
Totals	8.40	\$1,657	\$152	\$138	\$0		\$1,947
0260120200	BEDDING, FOR PIPE IN TRENCH SAND, DEAD OR BANK					650.00 C.Y.	
Unit values	0.16	3.79	2.79	1.13	0.00		7.71
Totals	104.00	\$2,462	\$1,814	\$736	\$0		\$5,012
0260120500	BEDDING, PLACING IN TRENCH					650.00 C.Y.	
Unit values	0.09	0.00	1.44	0.55	0.00		1.99
Totals	57.85	\$0	\$935	\$360	\$0		\$1,295
0266907800	CUT IN VALVES, W/DUCK TIP GASKET, 4" DIAMETER					2.00 Ea.	

Unit values	1.56	404.00	29.36	4.89	0.00	438.25
Totals	3.11	\$808	\$59	\$10	\$0	\$877

0266907820 CUT IN VALVES, W/DUCK TIP GASKET, 6" DIAMETER

					1.00 Ea.	
Unit values	2.33	530.25	43.83	7.36	0.00	581.44
Totals	2.33	\$530	\$44	\$7	\$0	\$581

0268520700 GAS SERVICE&DISTRIB PIPING, SCH40 STEEL PLAIN
END, TAR COAT&WRAP 4" DIAM 13500.00 L.F.

Unit values	0.19	9.39	3.71	1.62	0.00	14.72
Totals	2538.00	\$126,806	\$50,090	\$21,828	\$0	\$198,724

0268520800 GAS SERVICE&DISTRIB PIPING, SCH40 STEEL PLAIN
END, TAR COAT&WRAP 6" DIAM 10000.00 L.F.

Unit values	0.27	17.27	5.28	2.29	0.00	24.84
Totals	2670.00	\$172,710	\$52,762	\$22,892	\$0	\$248,364

=====						
Line #	Description					
		Manhours	Matl	Labor	Equipment	Sub
=====						
U02 SITEWORK		11392	\$333,697	\$214,258	\$128,529	\$0
						\$676,484
1517019310	PIPE STEEL SCH 40 WELD ONE JOINT LABOR ONLY					
	4" DIAM					1350.00 Ea.
Unit values	1.60	0.00	24.81	3.09	0.00	27.89
Totals	2160.00	\$0	\$33,487	\$4,165	\$0	\$37,652
1517019330	PIPE STEEL SCH 40 WELD ONE JOINT LABOR ONLY					
	6" DIAM					950.00 Ea.
Unit values	2.00	0.00	30.86	3.87	0.00	34.73
Totals	1900.00	\$0	\$29,312	\$3,678	\$0	\$32,990
1517203130	PIPE LONG RADIUS WELD ELBOW 90< 4"DIAM					
						10.00 Ea.
Unit values	3.20	17.13	49.31	6.20	0.00	72.64
Totals	32.00	\$171	\$493	\$62	\$0	\$726
1517203140	PIPE LONG RADIUS WELD ELBOW 90< 6"DIAM					
						10.00 Ea.
Unit values	4.80	40.96	76.84	6.17	0.00	123.97
Totals	48.00	\$410	\$768	\$62	\$0	\$1,240
1517203290	PIPE WELD ELBOW 45< 4"DIAM LONG					
						6.00 Ea.
Unit values	3.20	14.69	49.31	6.20	0.00	70.19
Totals	19.20	\$88	\$296	\$37	\$0	\$421
1517203300	PIPE WELD ELBOW 45< 6"DIAM LONG					
						4.00 Ea.
Unit values	4.80	31.47	76.84	6.17	0.00	114.47
Totals	19.20	\$126	\$307	\$25	\$0	\$458
1517203440	PIPE BLACK STEEL WELD TEE 4"DIAM					
						4.00 Ea.
Unit values	5.33	30.97	82.28	10.32	0.00	123.56
Totals	21.33	\$124	\$329	\$41	\$0	\$494
1517203450	PIPE BLACK STEEL WELD TEE 6"DIAM					
						2.00 Ea.
Unit values	8.00	56.94	127.66	10.32	0.00	194.91
Totals	16.00	\$114	\$255	\$21	\$0	\$390
1517203496	REDUCER, ECCENTRIC, BUTT WELD 6"DIAM					
						3.00 Ea.
Unit values	4.80	32.47	76.84	6.17	0.00	115.47
Totals	14.40	\$97	\$231	\$19	\$0	\$347
1562600142	GAS APPLIANCE REGULATORS DOUBLE DIAPHRAGM					
	TYPE 4" PIPE SIZE					3.00 Ea.

05-Apr-95

MeansData for Lotus

Page 4

Unit values	2.00	1448.55	30.86	0.00	0.00	1479.41
Totals	6.00	\$4,346	\$93	\$0	\$0	\$4,439

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=====
Line #      Description
-----
            Manhours   Matl      Labor   Equipment   Sub      Total
=====
U15 MECHANICA  4237      $5,476   $65,571   $8,110         $0      $79,157

ESTIMATE TOTA 15629    $339,173 $279,829  $136,639         $0      $755,641

SALES TAX      7.00%    $23,742
MATL MARKUP    11.00%    $37,309
LABOR MARKUP   35.00%           $97,940
EQUIPT MARKUP  5.00%           $6,832
SUB MARKUP     5.00%
                                $0

TOTAL BEFORE CONTINGE $400,224  $377,769  $143,471         $0      $921,464
CONTINGENCY     10.00%           $92,146
BOND             5.00%           $46,073
PROFIT          10.00%           $92,146

JOB TOTAL                                           $1,151,830

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Estimate:      SIMMONS AAF      Date:      04-Apr-95
Description:   COST ESTIMATE (100% OF REQ'D MAIN - 6" & 4" STEEL)
Project:      LIMITED EEAP(HGR) Bid Date:
Location:     FORT BRAGG, N.C.  Job #:      94013.04
Sq. footage:  MAIN GAS LINE    City indx:Raleigh, NC
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SUMMARY

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      Manhours   Matl      Labor   Equipment   Sub      Total
=====
U02 SITEWORK    11392   $333,697   $214,258   $128,529       $0   $676,484
U15 MECHANICA   4237    $5,476    $65,571    $8,110         $0   $79,157
TOTAL          15629   $339,173   $279,829   $136,639       $0   $755,641

SALES TAX       7.00%   $23,742
MATL MARKUP     11.00%   $37,309
LABOR MARKUP    35.00%           $97,940
EQUIPT MARKUP   5.00%           $6,832
SUB MARKUP      5.00%               $0

TOTAL BEFORE CONTINGE $400,224   $377,769   $143,471       $0   $921,464
CONTINGENCY      10.00%           $92,146
BOND              5.00%           $46,073
PROFIT           10.00%           $92,146

JOB TOTAL                                     $1,151,830

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LCCA & COST ESTIMATE

(sorted by building)

LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 2936EO2A

LCCID FY95 (92)

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 94013.04 LES: ECO2 - NAT GAS INFRARED HEAT

FISCAL YEAR 95 DISCRETE PORTION NAME: ECO

ANALYSIS DATE: 12-12-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	169852.		
B. SIOH	\$	8493.		
C. DESIGN COST	\$	8493.		
D. TOTAL COST (1A+1B+1C)	\$	186838.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.		
F. PUBLIC UTILITY COMPANY REBATE	\$	0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)			\$	186838.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH (1)	SAVINGS MWH/YR (2)	ANNUAL \$ SAVINGS (3)	DISCOUNT FACTOR (4)	DISCOUNTED SAVINGS (5)
A. ELECT	\$ 34.95	38.	\$ 1342.	15.08	\$ 20244.
B. DIST	\$ 19.18	2084.	\$ 39975.	18.57	\$ 742335.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	-1098.	\$ -14754.	18.58	\$ -274137.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 0.	14.88	\$ 0.
N. TOTAL		1025.	\$ 26563.		\$ 488441.

3. NON ENERGY SAVINGS (+) / COST (-)

A. ANNUAL RECURRING (+/-)		\$	2374.
(1) DISCOUNT FACTOR (TABLE A)		14.88	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$	35319.

B. NON RECURRING SAVINGS (+) / COSTS (-)

ITEM	SAVINGS (+) COST (-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS (+) / COST (-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS (+) / COST (-) (3A2+3Bd4) \$ 35319.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ 28937.

5. SIMPLE PAYBACK PERIOD (1G/4) 6.46 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 523760.

7. SAVINGS TO INVESTMENT RATIO (SIR) = (6 / 1G) = 2.80
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 8.45 %

LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 2936EO2B

LCCID FY95 (92)

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 94013.04 LES: ECO2 - NAT GAS INFRARED HEAT

FISCAL YEAR 95 DISCRETE PORTION NAME: ECO

ANALYSIS DATE: 12-12-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	200987.		
B. SIOH	\$	10049.		
C. DESIGN COST	\$	10049.		
D. TOTAL COST (1A+1B+1C)	\$	221085.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.		
F. PUBLIC UTILITY COMPANY REBATE	\$	0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)			\$	221085.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	38.	\$ 1342.	15.08	\$ 20244.
B. DIST	\$ 19.18	2084.	\$ 39975.	18.57	\$ 742335.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	-1098.	\$ -14754.	18.58	\$ -274137.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 0.	14.88	\$ 0.
N. TOTAL		1025.	\$ 26563.		\$ 488441.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$	2374.
(1) DISCOUNT FACTOR (TABLE A)	14.88		
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$	35319.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-) (4)
d. TOTAL	\$	0.		0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-) (3A2+3Bd4) \$ 35319.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS\ ECONOMIC\ LIFE))$ \$ 28937.

5. SIMPLE PAYBACK PERIOD (1G/4) 7.64 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 523760.

7. SAVINGS TO INVESTMENT RATIO (SIR) = $(6 / 1G) =$ 2.37
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 7.54 %

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Estimate:      BLDG 2936      Date:      23-Nov-94
Description:    INSTALL INFARED HEATING SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG, N.C. Job #:      94013.04
Sq. footage:   *****      City indx:Raleigh, NC
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Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0205541750	PAVEMENT REMOVAL, BITUMINOUS, 4" TO 6" THICK					40.00 S.Y.	
Unit values	0.10	0.00	1.73	2.50	0.00		4.23
Totals	3.80	\$0	\$69	\$100	\$0		\$169
0205543200	SITE REMOVAL, STEEL PIPE, WELDED CONNECTION, UP TO 4" DIAMETER					4000.00 L.F.	
Unit values	0.15	0.00	2.61	1.06	0.00		3.68
Totals	600.00	\$0	\$10,450	\$4,255	\$0		\$14,705
0207180390	HVAC DEMO, BOILER GAS/OIL STL >150MBH					(qty) Ea.	
Unit values	12.00	0.00	268.07	0.00	0.00		268.07
Totals	0.00	\$0	\$0	\$0	\$0		\$0
0207183600	HVAC DEMO, MECH EQPT HEAVY ITEM					2.00 Ton	
Unit values	14.55	0.00	314.87	0.00	0.00		314.87
Totals	29.09	\$0	\$630	\$0	\$0		\$630
0208400600	REMOVE PIPE INSULATION UP TO 4" DIAMETER PIPE					4000.00 L.F.	
Unit values	0.07	0.00	1.63	0.20	0.00		1.83
Totals	284.00	\$0	\$6,536	\$783	\$0		\$7,319
0208401000	REMOVE INSULATION FROM PIPE FITTING, UP TO 4" DIAMETER PIPE					500.00 Ea.	
Unit values	0.20	0.00	4.60	0.56	0.00		5.16
Totals	100.00	\$0	\$2,298	\$281	\$0		\$2,579
0222541900	TAMPING TRENCH B'FILL, VIBRATING PLATE, ADD					25.00 C.Y.	
Unit values	0.09	0.00	1.44	0.55	0.00		1.99
Totals	2.23	\$0	\$36	\$14	\$0		\$50
0222582800	TRENCH EXCVTNG 40HP CHNTRNCHR&BKFL 12"W24"D					250.00 L.F.	
Unit values	0.01	0.00	0.20	0.20	0.00		0.39
Totals	2.50	\$0	\$49	\$49	\$0		\$98
0251040380	ASPHALTIC CONCRETE PAVEMENT, PAVING, WEARING						

	COURSE, 2" THICK					40.00 S.Y.	
Unit values	0.02	2.96	0.27	0.25	0.00	3.48	
Totals	0.60	\$118	\$11	\$10	\$0	\$139	
0260120200	BEDDING, FOR PIPE IN TRENCH SAND, DEAD OR BANK					5.00 C.Y.	
Unit values	0.16	3.79	2.79	1.13	0.00	7.71	
Totals	0.80	\$19	\$14	\$6	\$0	\$39	
0260120500	BEDDING, PLACING IN TRENCH					5.00 C.Y.	
Unit values	0.09	0.00	1.44	0.55	0.00	1.99	
Totals	0.45	\$0	\$7	\$3	\$0	\$10	
0266907800	CUT IN VALVES, W/DUCK TIP GASKET, 4" DIAMETER					1.00 Ea.	
Unit values	1.56	404.00	29.36	4.89	0.00	438.25	
Totals	1.56	\$404	\$29	\$5	\$0	\$438	
0268520150	GAS SERVICE & DISTRIB PIPING, POLYETHYLENE, 60-PSI 1-1/4" DIAM SDR 10, COIL					260.00 L.F.	
Unit values	0.06	0.63	1.10	0.00	0.00	1.72	
Totals	15.60	\$163	\$285	\$0	\$0	\$448	
0268520600	GAS SERVICE&DISTRIB PIPING, SCH40 STEEL PLAIN END, TAR COAT&WRAP 1-1/4" DIAM					50.00 L.F.	
Unit values	0.11	3.40	2.63	0.15	0.00	6.19	
Totals	5.70	\$170	\$131	\$8	\$0	\$309	

=====						
Line #	Description					

	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
U02 SITEWORK	1047	\$874	\$20,545	\$5,514	\$0	\$26,933
1551153320	HTG BR GAS CI STD HTWR GOP 2000 MBH					
					1.00 Ea.	
Unit values	84.21	12487.50	1376.38	0.00	0.00	13863.88
Totals	84.21	\$12,488	\$1,376	\$0	\$0	\$13,864
1554510245	HTG CO-RAY-VAC INFA-RD UNT GAS ELEC IGN					
	(See Attached Estimate for details)					
					1.00 LS	
Unit values	0.00	0.00	0.00	89623.00	0.00	89623.00
Totals	0.00	\$0	\$0	\$89,623	\$0	\$89,623
1562600137	GAS APPLIANCE REGULATORS DOUBLE DIAPHRAGM					
	TYPE 1-1/4" PIPE SIZE					
					1.00 Ea.	
Unit values	0.53	225.77	9.14	0.00	0.00	234.91
Totals	0.53	\$226	\$9	\$0	\$0	\$235
U15 MECHANICAL	85	\$12,714	\$1,385	\$89,623	\$0	\$103,722

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Line #      Description
-----
      Manhours   Matl    Labor   Equipment   Sub    Total
=====
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ESTIMATE TOTAL	1132	\$13,588	\$21,930	\$95,137	\$0	\$130,655
SALES TAX	0.00%	\$0				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$13,588	\$21,930	\$95,137	\$0	\$130,655
CONTINGENCY	20.00%					\$26,131
BOND	0.00%					\$0
PROFIT	10.00%					\$13,066
JOB TOTAL						\$169,852


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Estimate:      BLDG 2936           Date:      23-Nov-94
Description:   INSTALL INFARED HEATING SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG, N.C.   Job #:      94013.04
Sq. footage:   *****           City indx:Raleigh, NC
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SUMMARY

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Manhours  Matl  Labor  Equipment  Sub  Total
=====
U02 SITEWORK      1047      $874  $20,545    $5,514      $0  $26,933
U15 MECHANICAL     85    $12,714    $1,385   $89,623      $0  $103,722
TOTAL             1132    $13,588   $21,930   $95,137      $0  $130,655

SALES TAX          0.00%      $0
MATL MARKUP        0.00%      $0
LABOR MARKUP       0.00%      $0
EQUIPT MARKUP      0.00%      $0
SUB MARKUP         0.00%      $0

TOTAL BEFORE CONTINGENC  $13,588   $21,930   $95,137      $0  $130,655
CONTINGENCY         20.00%      $26,131
BOND                0.00%      $0
PROFIT              10.00%      $13,066
JOB TOTAL                                     $169,852

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LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 3007EO2A

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) LCCID FY95 (92)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 94013.04 LES: ECO2 - NAT GAS INFRARED HEAT

FISCAL YEAR 95 DISCRETE PORTION NAME: ECO

ANALYSIS DATE: 12-12-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	156174.		
B. SIOH	\$	7809.		
C. DESIGN COST	\$	7809.		
D. TOTAL COST (1A+1B+1C)	\$	171792.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.		
F. PUBLIC UTILITY COMPANY REBATE	\$	0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)			\$	171792.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	21.	\$ 726.	15.08	\$ 10952.
B. DIST	\$ 19.18	2352.	\$ 45104.	18.57	\$ 837586.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	-1371.	\$ -18429.	18.58	\$ -342407.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 0.	14.88	\$ 0.
N. TOTAL		1001.	\$ 27402.		\$ 506131.

3. NON ENERGY SAVINGS (+) / COST (-)

A. ANNUAL RECURRING (+/-)		\$	138.
(1) DISCOUNT FACTOR (TABLE A)		14.88	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$	2051.

B. NON RECURRING SAVINGS (+) / COSTS (-)

ITEM	SAVINGS (+) COST (-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS (+) / COST (-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS (+) / COST (-) (3A2+3Bd4) \$ 2051.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ 27540.

5. SIMPLE PAYBACK PERIOD (1G/4) 6.24 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 508182.

7. SAVINGS TO INVESTMENT RATIO (SIR) = $(6 / 1G) =$ 2.96
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 8.74 %

LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 3007EO2B

LCCID FY95 (92)

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 94013.04 LES: ECO2 - NAT GAS INFRARED HEAT

FISCAL YEAR 95 DISCRETE PORTION NAME: ECO

ANALYSIS DATE: 12-12-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	187309.		
B. SIOH	\$	9365.		
C. DESIGN COST	\$	9365.		
D. TOTAL COST (1A+1B+1C)	\$	206039.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.		
F. PUBLIC UTILITY COMPANY REBATE	\$	0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)			\$	206039.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	21.	\$ 726.	15.08	\$ 10952.
B. DIST	\$ 19.18	2352.	\$ 45104.	18.57	\$ 837586.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	-1371.	\$ -18429.	18.58	\$ -342407.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 0.	14.88	\$ 0.
N. TOTAL		1001.	\$ 27402.		\$ 506131.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$	138.
(1) DISCOUNT FACTOR (TABLE A)		14.88	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$	2051.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-) (3A2+3Bd4) \$ 2051.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS\ ECONOMIC\ LIFE))$ \$ 27540.

5. SIMPLE PAYBACK PERIOD (1G/4) 7.48 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 508182.

7. SAVINGS TO INVESTMENT RATIO (SIR)=(6 / 1G)= 2.47
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 7.76 %

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=====
Estimate:      BLDG 3007      Date:      23-Nov-94
Description:    INSTALL INFARED HEATING SYSTEM COST ESTIMATE
Project:        LIMITED EEAP(HGR) Bid Date:
Location:       FORT BRAGG, N.C. Job #:      94013.04
Sq. footage:    *****      City indx:Raleigh, NC
=====

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Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0205541750	PAVEMENT REMOVAL, BITUMINOUS, 4" TO 6" THICK					40.00 S.Y.	
Unit values	0.10	0.00	1.73	2.50	0.00		4.23
Totals	3.80	\$0	\$69	\$100	\$0		\$169
0205543200	SITE REMOVAL, STEEL PIPE, WELDED CONNECTION, UP TO 4" DIAMETER					3000.00 L.F.	
Unit values	0.15	0.00	2.61	1.06	0.00		3.68
Totals	450.00	\$0	\$7,838	\$3,191	\$0		\$11,029
0207183600	HVAC DEMO, MECH EQPT HEAVY ITEM					3.00 Ton	
Unit values	14.55	0.00	314.87	0.00	0.00		314.87
Totals	43.64	\$0	\$945	\$0	\$0		\$945
0208400600	REMOVE PIPE INSULATION UP TO 4" DIAMETER PIPE					3000.00 L.F.	
Unit values	0.07	0.00	1.63	0.20	0.00		1.83
Totals	213.00	\$0	\$4,902	\$587	\$0		\$5,489
0208401000	REMOVE INSULATION FROM PIPE FITTING, UP TO 4" DIAMETER PIPE					400.00 Ea.	
Unit values	0.20	0.00	4.60	0.56	0.00		5.16
Totals	80.00	\$0	\$1,838	\$225	\$0		\$2,063
0222541900	TAMPING TRENCH B'FILL, VIBRATING PLATE, ADD					60.00 C.Y.	
Unit values	0.09	0.00	1.44	0.55	0.00		1.99
Totals	5.34	\$0	\$86	\$33	\$0		\$119
0222582800	TRENCH EXCVTNG 40HP CHNTRNCHR&BKFL 12"W24"D					600.00 L.F.	
Unit values	0.01	0.00	0.20	0.20	0.00		0.39
Totals	6.00	\$0	\$117	\$117	\$0		\$234
0251040380	ASPHALTIC CONCRETE PAVEMENT, PAVING, WEARING COURSE, 2" THICK					40.00 S.Y.	
Unit values	0.02	2.96	0.27	0.25	0.00		3.48
Totals	0.60	\$118	\$11	\$10	\$0		\$139

0260120200	BEDDING, FOR PIPE IN TRENCH SAND, DEAD OR BANK						10.00 C.Y.
Unit values	0.16	3.79	2.79	1.13	0.00	7.71	
Totals	1.60	\$38	\$28	\$11	\$0	\$77	
0260120500	BEDDING, PLACING IN TRENCH						10.00 C.Y.
Unit values	0.09	0.00	1.44	0.55	0.00	1.99	
Totals	0.89	\$0	\$14	\$6	\$0	\$20	
0266907800	CUT IN VALVES, W/DUCK TIP GASKET, 4" DIAMETER						1.00 Ea.
Unit values	1.56	404.00	29.36	4.89	0.00	438.25	
Totals	1.56	\$404	\$29	\$5	\$0	\$438	
0268520150	GAS SERVICE & DISTRIB PIPING, POLYETHYLENE, 60- PSI 1-1/4" DIAM SDR 10, COIL						610.00 L.F.
Unit values	0.06	0.63	1.10	0.00	0.00	1.72	
Totals	36.60	\$382	\$670	\$0	\$0	\$1,052	
0268520600	GAS SERVICE&DISTRIB PIPING, SCH40 STEEL PLAIN END, TAR COAT&WRAP 1-1/4" DIAM						50.00 L.F.
Unit values	0.11	3.40	2.63	0.15	0.00	6.19	
Totals	5.70	\$170	\$131	\$8	\$0	\$309	

=====						
Line #	Description					

	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
U02 SITEWORK	849	\$1,112	\$16,678	\$4,293	\$0	\$22,083
1531106180	WTR HTR CML 100<R GAS 200 MBH 192 GPH REUSE EXISTING VENT				1.00 Ea.	
Unit values	13.33	2097.90	226.88	0.00	0.00	2324.78
Totals	13.33	\$2,098	\$227	\$0	\$0	\$2,325
1551153320	HTG BR GAS CI STD HTWR GOP 2000 MBH				1.00 Ea.	
Unit values	84.21	12487.50	1376.38	0.00	0.00	13863.88
Totals	84.21	\$12,488	\$1,376	\$0	\$0	\$13,864
1554510245	HTG CO-RAY-VAC INFA-RD UNT GAS ELEC IGN (See Attached Estimate for details)				1.00 LS	
Unit values	0.00	0.00	0.00	81627.00	0.00	81627.00
Totals	0.00	\$0	\$0	\$81,627	\$0	\$81,627
1562600137	GAS APPLIANCE REGULATORS DOUBLE DIAPHRAGM TYPE 1-1/4" PIPE SIZE				1.00 Ea.	
Unit values	0.53	225.77	9.14	0.00	0.00	234.91
Totals	0.53	\$226	\$9	\$0	\$0	\$235
U15 MECHANICAL	99	\$14,812	\$1,612	\$81,627	\$0	\$98,051

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=====
Line #      Description
-----
      Manhours   Matl     Labor   Equipment   Sub     Total
=====
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ESTIMATE TOTAL	948	\$15,924	\$18,290	\$85,920	\$0	\$120,134
SALES TAX	0.00%	\$0				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$15,924	\$18,290	\$85,920	\$0	\$120,134
CONTINGENCY	20.00%					\$24,027
BOND	0.00%					\$0
PROFIT	10.00%					\$12,013
JOB TOTAL						\$156,174

```

=====
Estimate:      BLDG 3007          Date:      23-Nov-94
Description:   INSTALL INFARED HEATING SYSTEM COST ESTIMATE
Project:      LIMITED EEAP(HGR) Bid Date:
Location:     FORT BRAGG, N.C.  Job #:      94013.04
Sq. footage:  *****          City indx:Raleigh, NC
=====

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SUMMARY

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Manhours  Matl    Labor   Equipment  Sub    Total
=====
U02 SITEWORK      849    $1,112   $16,678    $4,293      $0    $22,083
U15 MECHANICAL     99    $14,812   $1,612    $81,627      $0    $98,051
TOTAL              948    $15,924   $18,290    $85,920      $0    $120,134

SALES TAX          0.00%      $0
MATL MARKUP        0.00%      $0
LABOR MARKUP       0.00%      $0
EQUIPT MARKUP      0.00%      $0
SUB MARKUP         0.00%      $0

TOTAL BEFORE CONTINGENC  $15,924   $18,290   $85,920      $0    $120,134
CONTINGENCY         20.00%      $24,027
BOND                 0.00%      $0
PROFIT              10.00%      $12,013

JOB TOTAL                                     $156,174

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LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 3262EO2A

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) LCCID FY95 (92)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 94013.04 LES: ECO2 - NAT GAS INFRARED HEAT

FISCAL YEAR 95 DISCRETE PORTION NAME: ECO

ANALYSIS DATE: 12-12-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	132691.		
B. SIOH	\$	6635.		
C. DESIGN COST	\$	6635.		
D. TOTAL COST (1A+1B+1C)	\$	145961.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$		0.	
F. PUBLIC UTILITY COMPANY REBATE	\$		0.	
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$			145961.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	22.	\$ 755.	15.08	\$ 11379.
B. DIST	\$ 19.18	3354.	\$ 64330.	18.57	\$ 1194617.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	-2675.	\$ -35945.	18.58	\$ -667866.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 0.	14.88	\$ 0.
N. TOTAL		701.	\$ 29140.		\$ 538130.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$ 2586.
(1) DISCOUNT FACTOR (TABLE A)	14.88	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$ 38479.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-) (3A2+3Bd4) \$ 38479.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ 31726.

5. SIMPLE PAYBACK PERIOD (1G/4) 4.60 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 576609.

7. SAVINGS TO INVESTMENT RATIO (SIR) = $(6 / 1G) =$ 3.95
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 10.32 %

LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 3262EO2B
LCCID FY95 (92)

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 94013.04 LES: ECO2 - NAT GAS INFRARED HEAT

FISCAL YEAR 95 DISCRETE PORTION NAME: ECO

ANALYSIS DATE: 12-12-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	163826.	
B. SIOH	\$	8191.	
C. DESIGN COST	\$	8191.	
D. TOTAL COST (1A+1B+1C)	\$	180208.	
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.	
F. PUBLIC UTILITY COMPANY REBATE	\$	0.	
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$		180208.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	22.	\$ 755.	15.08	\$ 11379.
B. DIST	\$ 19.18	3354.	\$ 64330.	18.57	\$ 1194617.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	-2675.	\$ -35945.	18.58	\$ -667866.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 0.	14.88	\$ 0.
N. TOTAL		701.	\$ 29140.		\$ 538130.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$	2586.
(1) DISCOUNT FACTOR (TABLE A)		14.88	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$	38479.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-) (3A2+3Bd4) \$ 38479.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ 31726.

5. SIMPLE PAYBACK PERIOD (1G/4) 5.68 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 576609.

7. SAVINGS TO INVESTMENT RATIO (SIR)=(6 / 1G)= 3.20
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 9.17 %

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=====
Estimate:      BLDG 3262      Date:      23-Nov-94
Description:    INSTALL INFARED HEATING SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG, N.C. Job #:      94013.04
Sq. footage:   *****      City indx:Raleigh, NC
=====

```

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0205541750	PAVEMENT REMOVAL, BITUMINOUS, 4" TO 6" THICK						
						30.00 S.Y.	
Unit values		0.10	0.00	1.73	2.50	0.00	4.23
Totals		2.85	\$0	\$52	\$75	\$0	\$127
0205543200	SITE REMOVAL, STEEL PIPE, WELDED CONNECTION, UP TO 4" DIAMETER					2000.00 L.F.	
Unit values		0.15	0.00	2.61	1.06	0.00	3.68
Totals		300.00	\$0	\$5,225	\$2,128	\$0	\$7,353
0207180380	HVAC DEMO, BOILER GAS/OIL STL >150MBH					1.00 Ea.	
Unit values		12.00	0.00	268.07	0.00	0.00	268.07
Totals		12.00	\$0	\$268	\$0	\$0	\$268
0207183600	HVAC DEMO, MECH EQPT HEAVY ITEM					4.00 Ton	
Unit values		14.55	0.00	314.87	0.00	0.00	314.87
Totals		58.18	\$0	\$1,259	\$0	\$0	\$1,259
0208400600	REMOVE PIPE INSULATION UP TO 4" DIAMETER PIPE					2000.00 L.F.	
Unit values		0.07	0.00	1.63	0.20	0.00	1.83
Totals		142.00	\$0	\$3,268	\$391	\$0	\$3,659
0208401000	REMOVE INSULATION FROM PIPE FITTING, UP TO 4" DIAMETER PIPE					250.00 Ea.	
Unit values		0.20	0.00	4.60	0.56	0.00	5.16
Totals		50.00	\$0	\$1,149	\$140	\$0	\$1,289
0222541900	TAMPING TRENCH B'FILL, VIBRATING PLATE, ADD					15.00 C.Y.	
Unit values		0.09	0.00	1.44	0.55	0.00	1.99
Totals		1.34	\$0	\$22	\$8	\$0	\$30
0222582800	TRENCH EXCVTNG 40HP CHNTRNCHR&BKFL 12"W24"D					200.00 L.F.	
Unit values		0.01	0.00	0.20	0.20	0.00	0.39
Totals		2.00	\$0	\$39	\$39	\$0	\$78
0251040380	ASPHALTIC CONCRETE PAVEMENT, PAVING, WEARING						

	COURSE, 2" THICK					30.00 S.Y.	
Unit values	0.02	2.96	0.27	0.25	0.00	3.48	
Totals	0.45	\$89	\$8	\$7	\$0	\$104	
0260120200	BEDDING, FOR PIPE IN TRENCH SAND, DEAD OR BANK					8.00 C.Y.	
Unit values	0.16	3.79	2.79	1.13	0.00	7.71	
Totals	1.28	\$30	\$22	\$9	\$0	\$61	
0260120500	BEDDING, PLACING IN TRENCH					8.00 C.Y.	
Unit values	0.09	0.00	1.44	0.55	0.00	1.99	
Totals	0.71	\$0	\$12	\$4	\$0	\$16	
0266907800	CUT IN VALVES, W/DUCK TIP GASKET, 4" DIAMETER					1.00 Ea.	
Unit values	1.56	404.00	29.36	4.89	0.00	438.25	
Totals	1.56	\$404	\$29	\$5	\$0	\$438	
0268520150	GAS SERVICE & DISTRIB PIPING, POLYETHYLENE, 60-PSI 1-1/4" DIAM SDR 10, COIL					210.00 L.F.	
Unit values	0.06	0.63	1.10	0.00	0.00	1.72	
Totals	12.60	\$132	\$231	\$0	\$0	\$363	
0268520600	GAS SERVICE&DISTRIB PIPING, SCH40 STEEL PLAIN END, TAR COAT&WRAP 1-1/4" DIAM					50.00 L.F.	
Unit values	0.11	3.40	2.63	0.15	0.00	6.19	
Totals	5.70	\$170	\$131	\$8	\$0	\$309	

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=====
Line #      Description
-----
              Manhours   Matl      Labor    Equipment    Sub      Total
=====
U02 SITEWORK      591      $825    $11,715    $2,814      $0    $15,354

1551153320      HTG BR GAS CI STD HTWR GOP 2000 MBH
Unit values      84.21   12487.50   1376.38      0.00      0.00   13863.88
Totals           84.21    $12,488    $1,376      $0      $0    $13,864

1554510245      HTG CO-RAY-VAC INFA-RD UNT GAS ELEC IGN
              (See Attached Estimate for details)
Unit values      0.00      0.00      0.00   72617.00      0.00   72617.00
Totals           0.00      $0      $0    $72,617      $0    $72,617

1562600137      GAS APPLIANCE REGULATORS DOUBLE DIAPHRAGM
              TYPE 1-1/4" PIPE SIZE
Unit values      0.53    225.77      9.14      0.00      0.00    234.91
Totals           0.53    $226      $9      $0      $0    $235

U15 MECHANICAL    85    $12,714    $1,385    $72,617      $0    $86,716

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=====
Line #      Description
-----
      Manhours   Matl    Labor   Equipment   Sub    Total
=====
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ESTIMATE TOTAL	676	\$13,539	\$13,100	\$75,431	\$0	\$102,070
SALES TAX	0.00%	\$0				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$13,539	\$13,100	\$75,431	\$0	\$102,070
CONTINGENCY	20.00%					\$20,414
BOND	0.00%					\$0
PROFIT	10.00%					\$10,207
JOB TOTAL						\$132,691

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=====
Estimate:      BLDG 3262      Date:      23-Nov-94
Description:    INSTALL INFARED HEATING SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG, N.C. Job #:      94013.04
Sq. footage:   *****      City indx:Raleigh, NC
=====

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SUMMARY

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-----
              Manhours    Matl      Labor    Equipment    Sub      Total
=====
U02 SITEWORK      591        $825    $11,715    $2,814        $0    $15,354
U15 MECHANICAL     85       $12,714    $1,385    $72,617        $0    $86,716
TOTAL             676       $13,539    $13,100    $75,431        $0    $102,070

SALES TAX         0.00%        $0
MATL MARKUP       0.00%        $0
LABOR MARKUP      0.00%        $0
EQUIPT MARKUP     0.00%        $0
SUB MARKUP        0.00%        $0

TOTAL BEFORE CONTINGENC $13,539    $13,100    $75,431        $0    $102,070
CONTINGENCY       20.00%        $20,414
BOND              0.00%        $0
PROFIT            10.00%        $10,207
JOB TOTAL                                     $132,691

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LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 3354EO2A

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) LCCID FY95 (92)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 94013.04 LES: ECO2 - NAT GAS INFRARED HEAT

FISCAL YEAR 95 DISCRETE PORTION NAME: ECO

ANALYSIS DATE: 12-05-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	71897.		
B. SIOH	\$	3595.		
C. DESIGN COST	\$	3595.		
D. TOTAL COST (1A+1B+1C)	\$	79087.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$		0.	
F. PUBLIC UTILITY COMPANY REBATE	\$		0.	
G. TOTAL INVESTMENT (1D - 1E - 1F)			\$	79087.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	-30.	\$ -1060.	15.08	\$ -15980.
B. DIST	\$ 19.18	1346.	\$ 25813.	18.57	\$ 479351.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	-840.	\$ -11286.	18.58	\$ -209688.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 0.	14.88	\$ 0.
N. TOTAL		476.	\$ 13468.		\$ 253683.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$	4989.
(1) DISCOUNT FACTOR (TABLE A)		14.88	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$	74234.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+) COST(-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-) (3A2+3Bd4) \$ 74234.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ 18457.

5. SIMPLE PAYBACK PERIOD (1G/4) 4.29 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 327917.

7. SAVINGS TO INVESTMENT RATIO (SIR) = $(6 / 1G) =$ 4.15
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 10.59 %

LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 3354EO2B

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) LCCID FY95 (92)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 94013.04 LES: ECO2 - NAT GAS INFRARED HEAT

FISCAL YEAR 95 DISCRETE PORTION NAME: ECO

ANALYSIS DATE: 12-05-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	103032.		
B. SIOH	\$	5152.		
C. DESIGN COST	\$	5152.		
D. TOTAL COST (1A+1B+1C)	\$	113336.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.		
F. PUBLIC UTILITY COMPANY REBATE	\$	0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)			\$	113336.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	-30.	\$ -1060.	15.08	\$ -15980.
B. DIST	\$ 19.18	1346.	\$ 25813.	18.57	\$ 479351.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	-840.	\$ -11286.	18.58	\$ -209688.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 0.	14.88	\$ 0.
N. TOTAL		476.	\$ 13468.		\$ 253683.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$	4989.
(1) DISCOUNT FACTOR (TABLE A)	14.88		
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$	74234.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+) COST(-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-) (3A2+3Bd4) \$ 74234.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ 18457.

5. SIMPLE PAYBACK PERIOD (1G/4) 6.14 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 327917.

7. SAVINGS TO INVESTMENT RATIO (SIR) = $(6 / 1G) =$ 2.89
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 8.62 %

```

=====
Estimate:      BLDG 3354      Date:      23-Nov-94
Description:    INSTALL INFARED HEATING SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG, N.C. Job #:      94013.04
Sq. footage:   *****      City indx:Raleigh, NC
=====

```

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0205541750	PAVEMENT REMOVAL, BITUMINOUS, 4" TO 6" THICK						
	30.00 S.Y.						
Unit values	0.10	0.00	1.73	2.50	0.00	4.23	
Totals	2.85	\$0	\$52	\$75	\$0	\$127	
0205543200	SITE REMOVAL, STEEL PIPE, WELDED CONNECTION, UP TO 4" DIAMETER						
	1600.00 L.F.						
Unit values	0.15	0.00	2.61	1.06	0.00	3.68	
Totals	240.00	\$0	\$4,180	\$1,702	\$0	\$5,882	
0207180380	HVAC DEMO, BOILER GAS/OIL STL >150MBH						
	(qty) Ea.						
Unit values	12.00	0.00	268.07	0.00	0.00	268.07	
Totals	0.00	\$0	\$0	\$0	\$0	\$0	
0207183600	HVAC DEMO, MECH EQPT HEAVY ITEM						
	1.50 Ton						
Unit values	14.55	0.00	314.87	0.00	0.00	314.87	
Totals	21.82	\$0	\$472	\$0	\$0	\$472	
0208400600	REMOVE PIPE INSULATION UP TO 4" DIAMETER PIPE						
	1400.00 L.F.						
Unit values	0.07	0.00	1.63	0.20	0.00	1.83	
Totals	99.40	\$0	\$2,287	\$274	\$0	\$2,561	
0208401000	REMOVE INSULATION FROM PIPE FITTING, UP TO 4" DIAMETER PIPE						
	160.00 Ea.						
Unit values	0.20	0.00	4.60	0.56	0.00	5.16	
Totals	32.00	\$0	\$735	\$90	\$0	\$825	
0222541900	TAMPING TRENCH B'FILL, VIBRATING PLATE, ADD						
	15.00 C.Y.						
Unit values	0.09	0.00	1.44	0.55	0.00	1.99	
Totals	1.34	\$0	\$22	\$8	\$0	\$30	
0222582800	TRENCH EXCVTNG 40HP CHNTRNCHR&BKFL 12"W24"D						
	200.00 L.F.						
Unit values	0.01	0.00	0.20	0.20	0.00	0.39	
Totals	2.00	\$0	\$39	\$39	\$0	\$78	
0251040380	ASPHALTIC CONCRETE PAVEMENT, PAVING, WEARING						

	COURSE, 2" THICK				30.00 S.Y.	
Unit values	0.02	2.96	0.27	0.25	0.00	3.48
Totals	0.45	\$89	\$8	\$7	\$0	\$104
0260120200	BEDDING, FOR PIPE IN TRENCH SAND, DEAD OR BANK					8.00 C.Y.
Unit values	0.16	3.79	2.79	1.13	0.00	7.71
Totals	1.28	\$30	\$22	\$9	\$0	\$61
0260120500	BEDDING, PLACING IN TRENCH					8.00 C.Y.
Unit values	0.09	0.00	1.44	0.55	0.00	1.99
Totals	0.71	\$0	\$12	\$4	\$0	\$16
0266907800	CUT IN VALVES, W/DUCK TIP GASKET, 4" DIAMETER					1.00 Ea.
Unit values	1.56	404.00	29.36	4.89	0.00	438.25
Totals	1.56	\$404	\$29	\$5	\$0	\$438
0268520150	GAS SERVICE & DISTRIB PIPING, POLYETHYLENE, 60-PSI 1-1/4" DIAM SDR 10, COIL					210.00 L.F.
Unit values	0.06	0.63	1.10	0.00	0.00	1.72
Totals	12.60	\$132	\$231	\$0	\$0	\$363
0268520600	GAS SERVICE&DISTRIB PIPING, SCH40 STEEL PLAIN END, TAR COAT&WRAP 1-1/4" DIAM					50.00 L.F.
Unit values	0.11	3.40	2.63	0.15	0.00	6.19
Totals	5.70	\$170	\$131	\$8	\$0	\$309

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=====
Line #      Description
-----
      Manhours  Matl    Labor  Equipment  Sub    Total
=====
U02 SITEWORK      422      $825    $8,220    $2,221      $0    $11,266

1554510245      HTG CO-RAY-VAC INFA-RD UNT GAS ELEC IGN
      (See Attached Estimate for details)
Unit values      0.00      0.00      0.00  43804.00      0.00  43804.00
Totals           0.00      $0      $0    $43,804      $0    $43,804

1562600137      GAS APPLIANCE REGULATORS DOUBLE DIAPHRAGM
      TYPE 1-1/4" PIPE SIZE
Unit values      0.53    225.77      9.14      0.00      0.00    234.91
Totals           0.53    $226      $9      $0      $0    $235

U15 MECHANICAL      1      $226      $9    $43,804      $0    $44,039
=====
```

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=====
Line #      Description
-----
           Manhours   Matl    Labor   Equipment   Sub    Total
=====
```

ESTIMATE TOTAL	423	\$1,051	\$8,229	\$46,025	\$0	\$55,305
SALES TAX	0.00%	\$0				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$1,051	\$8,229	\$46,025	\$0	\$55,305
CONTINGENCY	20.00%					\$11,061
BOND	0.00%					\$0
PROFIT	10.00%					\$5,531
JOB TOTAL						\$71,897

```

=====
Estimate:      BLDG 3354      Date:      23-Nov-94
Description:   INSTALL INFARED HEATING SYSTEM COST ESTIMATE
Project:      LIMITED EEAP(HGR) Bid Date:
Location:     FORT BRAGG, N.C. Job #:      94013.04
Sq. footage:  *****      City indx:Raleigh, NC
=====

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SUMMARY

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              Manhours    Matl    Labor    Equipment    Sub    Total
=====
U02 SITEWORK      422      $825    $8,220    $2,221      $0    $11,266
U15 MECHANICAL     1      $226      $9    $43,804      $0    $44,039
TOTAL             423    $1,051    $8,229    $46,025      $0    $55,305

SALES TAX          0.00%      $0
MATL MARKUP        0.00%      $0
LABOR MARKUP       0.00%      $0
EQUIPT MARKUP      0.00%      $0
SUB MARKUP         0.00%      $0

TOTAL BEFORE CONTINGENC $1,051    $8,229    $46,025      $0    $55,305
CONTINGENCY        20.00%      $0
BOND               0.00%      $0
PROFIT            10.00%      $5,531

JOB TOTAL                                     $71,897

```

LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 3637EO2A
LCCID FY95 (92)

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 94013.04 LES: ECO2 - NAT GAS INFRARED HEAT

FISCAL YEAR 95 DISCRETE PORTION NAME: ECO

ANALYSIS DATE: 12-12-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	75196.	
B. SIOH	\$	3760.	
C. DESIGN COST	\$	3760.	
D. TOTAL COST (1A+1B+1C)	\$	82716.	
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.	
F. PUBLIC UTILITY COMPANY REBATE	\$	0.	
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$		82716.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	27.	\$ 943.	15.08	\$ 14220.
B. DIST	\$ 19.18	1045.	\$ 20049.	18.57	\$ 372311.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	-574.	\$ -7717.	18.58	\$ -143389.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 0.	14.88	\$ 0.
N. TOTAL		498.	\$ 13275.		\$ 243142.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$	100.
(1) DISCOUNT FACTOR (TABLE A)	14.88		
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$	1488.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-) (3A2+3Bd4) \$ 1488.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS\ ECONOMIC\ LIFE))$ \$ 13375.

5. SIMPLE PAYBACK PERIOD (1G/4) 6.18 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 244630.

7. SAVINGS TO INVESTMENT RATIO (SIR) = (6 / 1G) = 2.96
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 8.74 %

LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 3637EO2B

LCCID FY95 (92)

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 94013.04 LES: ECO2 - NAT GAS INFRARED HEAT

FISCAL YEAR 95 DISCRETE PORTION NAME: ECO

ANALYSIS DATE: 12-12-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	106331.		
B. SIOH	\$	5317.		
C. DESIGN COST	\$	5317.		
D. TOTAL COST (1A+1B+1C)	\$	116965.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.		
F. PUBLIC UTILITY COMPANY REBATE	\$	0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$		116965.	

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	27.	\$ 943.	15.08	\$ 14220.
B. DIST	\$ 19.18	1045.	\$ 20049.	18.57	\$ 372311.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	-574.	\$ -7717.	18.58	\$ -143389.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 0.	14.88	\$ 0.
N. TOTAL		498.	\$ 13275.		\$ 243142.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$	100.
(1) DISCOUNT FACTOR (TABLE A)		14.88	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$	1488.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-) (3A2+3Bd4) \$ 1488.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS\ ECONOMIC\ LIFE))$ \$ 13375.

5. SIMPLE PAYBACK PERIOD (1G/4) 8.75 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 244630.

7. SAVINGS TO INVESTMENT RATIO (SIR) = $(6 / 1G) =$ 2.09
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 6.87 %


```

=====
Estimate:      BLDG 3637          Date:      23-Nov-94
Description:    INSTALL INFARED HEATING SYSTEM COST ESTIMATE
Project:        LIMITED EEAP(HGR) Bid Date:
Location:       FORT BRAGG, N.C.  Job #:      94013.04
Sq. footage:    *****          City indx:Raleigh, NC
=====

```

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0205541750	PAVEMENT REMOVAL, BITUMINOUS, 4" TO 6" THICK					20.00 S.Y.	
Unit values	0.10	0.00	1.73	2.50	0.00		4.23
Totals	1.90	\$0	\$35	\$50	\$0		\$85
0205543200	SITE REMOVAL, STEEL PIPE, WELDED CONNECTION, UP TO 4" DIAMETER					1000.00 L.F.	
Unit values	0.15	0.00	2.61	1.06	0.00		3.68
Totals	150.00	\$0	\$2,613	\$1,064	\$0		\$3,677
0207180380	HVAC DEMO, BOILER GAS/OIL STL >150MBH					1.00 Ea.	
Unit values	12.00	0.00	268.07	0.00	0.00		268.07
Totals	12.00	\$0	\$268	\$0	\$0		\$268
0207183600	HVAC DEMO, MECH EQPT HEAVY ITEM					1.00 Ton	
Unit values	14.55	0.00	314.87	0.00	0.00		314.87
Totals	14.55	\$0	\$315	\$0	\$0		\$315
0208400600	REMOVE PIPE INSULATION UP TO 4" DIAMETER PIPE					1000.00 L.F.	
Unit values	0.07	0.00	1.63	0.20	0.00		1.83
Totals	71.00	\$0	\$1,634	\$196	\$0		\$1,830
0208401000	REMOVE INSULATION FROM PIPE FITTING, UP TO 4" DIAMETER PIPE					125.00 Ea.	
Unit values	0.20	0.00	4.60	0.56	0.00		5.16
Totals	25.00	\$0	\$574	\$70	\$0		\$644
0222541900	TAMPING TRENCH B'FILL, VIBRATING PLATE, ADD					15.00 C.Y.	
Unit values	0.09	0.00	1.44	0.55	0.00		1.99
Totals	1.34	\$0	\$22	\$8	\$0		\$30
0222582800	TRENCH EXCVTNG 40HP CHNTRNCHR&BKFL 12"W24"D					150.00 L.F.	
Unit values	0.01	0.00	0.20	0.20	0.00		0.39
Totals	1.50	\$0	\$29	\$29	\$0		\$58
0251040380	ASPHALTIC CONCRETE PAVEMENT, PAVING, WEARING						

	COURSE, 2" THICK					20.00 S.Y.	
Unit values	0.02	2.96	0.27	0.25	0.00	3.48	
Totals	0.30	\$59	\$5	\$5	\$0	\$69	
0260120200	BEDDING, FOR PIPE IN TRENCH SAND, DEAD OR BANK					2.50 C.Y.	
Unit values	0.16	3.79	2.79	1.13	0.00	7.71	
Totals	0.40	\$9	\$7	\$3	\$0	\$19	
0260120500	BEDDING, PLACING IN TRENCH					2.50 C.Y.	
Unit values	0.09	0.00	1.44	0.55	0.00	1.99	
Totals	0.22	\$0	\$4	\$1	\$0	\$5	
0266907800	CUT IN VALVES, W/DUCK TIP GASKET, 4" DIAMETER					1.00 Ea.	
Unit values	1.56	404.00	29.36	4.89	0.00	438.25	
Totals	1.56	\$404	\$29	\$5	\$0	\$438	
0268520150	GAS SERVICE & DISTRIB PIPING, POLYETHYLENE, 60-PSI 1-1/4" DIAM SDR 10, COIL					160.00 L.F.	
Unit values	0.06	0.63	1.10	0.00	0.00	1.72	
Totals	9.60	\$100	\$176	\$0	\$0	\$276	
0268520600	GAS SERVICE&DISTRIB PIPING, SCH40 STEEL PLAIN END, TAR COAT&WRAP 1-1/4" DIAM					50.00 L.F.	
Unit values	0.11	3.40	2.63	0.15	0.00	6.19	
Totals	5.70	\$170	\$131	\$8	\$0	\$309	

=====						
Line #	Description					

	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
U02 SITEWORK	296	\$742	\$5,842	\$1,439	\$0	\$8,023
1551153320	HTG BR GAS CI STD HTWR GOP 2000 MBH					
					1.00 Ea.	
Unit values	84.21	12487.50	1376.38	0.00	0.00	13863.88
Totals	84.21	\$12,488	\$1,376	\$0	\$0	\$13,864
1554510245	HTG CO-RAY-VAC INFA-RD UNT GAS ELEC IGN (See Attached Estimate for details)					
					1.00 LS	
Unit values	0.00	0.00	0.00	35721.00	0.00	35721.00
Totals	0.00	\$0	\$0	\$35,721	\$0	\$35,721
1562600137	GAS APPLIANCE REGULATORS DOUBLE DIAPHRAGM TYPE 1-1/4" PIPE SIZE					
					1.00 Ea.	
Unit values	0.53	225.77	9.14	0.00	0.00	234.91
Totals	0.53	\$226	\$9	\$0	\$0	\$235
U15 MECHANICAL	85	\$12,714	\$1,385	\$35,721	\$0	\$49,820

```
=====
Line #      Description
-----
      Manhours   Matl    Labor   Equipment   Sub    Total
=====
```

ESTIMATE TOTAL	381	\$13,456	\$7,227	\$37,160	\$0	\$57,843
SALES TAX	0.00%	\$0				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$13,456	\$7,227	\$37,160	\$0	\$57,843
CONTINGENCY	20.00%					\$11,569
BOND	0.00%					\$0
PROFIT	10.00%					\$5,784
JOB TOTAL						\$75,196

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=====
Estimate:      BLDG 3637          Date:      23-Nov-94
Description:    INSTALL INFARED HEATING SYSTEM COST ESTIMATE
Project:        LIMITED EEAP(HGR) Bid Date:
Location:       FORT BRAGG, N.C.  Job #:      94013.04
Sq. footage:    *****          City indx:Raleigh, NC
=====

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SUMMARY

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-----
Manhours  Matl    Labor  Equipment  Sub    Total
=====
U02 SITEWORK      296      $742    $5,842    $1,439      $0    $8,023
U15 MECHANICAL     85     $12,714  $1,385    $35,721      $0    $49,820
TOTAL             381     $13,456  $7,227    $37,160      $0    $57,843

SALES TAX          0.00%      $0
MATL MARKUP        0.00%      $0
LABOR MARKUP       0.00%      $0
EQUIPT MARKUP      0.00%      $0
SUB MARKUP         0.00%      $0

TOTAL BEFORE CONTINGENC $13,456  $7,227  $37,160      $0    $57,843
CONTINGENCY        20.00%      $0
BOND               0.00%      $0
PROFIT            10.00%      $0

JOB TOTAL                                     $75,196

```

LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 3642EO2A

LCCID FY95 (92)

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 94013.04 LES: ECO2 - NAT GAS INFRARED HEAT

FISCAL YEAR 95 DISCRETE PORTION NAME: ECO

ANALYSIS DATE: 12-05-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	81151.		
B. SIOH	\$	4058.		
C. DESIGN COST	\$	4058.		
D. TOTAL COST (1A+1B+1C)	\$	89267.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.		
F. PUBLIC UTILITY COMPANY REBATE	\$	0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$		89267.	

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH (1)	SAVINGS MWH/YR (2)	ANNUAL \$ SAVINGS (3)	DISCOUNT FACTOR (4)	DISCOUNTED SAVINGS (5)
A. ELECT	\$ 34.95	6.	\$ 226.	15.08	\$ 3410.
B. DIST	\$ 19.18	1474.	\$ 28273.	18.57	\$ 525027.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	-1018.	\$ -13688.	18.58	\$ -254325.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 0.	14.88	\$ 0.
N. TOTAL		462.	\$ 14811.		\$ 274112.

3. NON ENERGY SAVINGS (+) / COST (-)

A. ANNUAL RECURRING (+/-)

(1) DISCOUNT FACTOR (TABLE A)	14.88	\$ 843.
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$ 12545.

B. NON RECURRING SAVINGS (+) / COSTS (-)

ITEM	SAVINGS (+) COST (-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS (+) / COST (-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS (+) / COST (-) (3A2+3Bd4) \$ 12545.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS\ ECONOMIC\ LIFE))$ \$ 15654.

5. SIMPLE PAYBACK PERIOD (1G/4) 5.70 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 286657.

7. SAVINGS TO INVESTMENT RATIO (SIR) = $(6 / 1G) =$ 3.21
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 9.19 %

LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 3642EO2B
LCCID FY95 (92)

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 94013.04 LES: ECO2 - NAT GAS INFRARED HEAT

FISCAL YEAR 95 DISCRETE PORTION NAME: ECO

ANALYSIS DATE: 12-05-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	112286.		
B. SIOH	\$	5614.		
C. DESIGN COST	\$	5614.		
D. TOTAL COST (1A+1B+1C)	\$	123514.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.		
F. PUBLIC UTILITY COMPANY REBATE	\$	0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$			123514.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	6.	\$ 226.	15.08	\$ 3410.
B. DIST	\$ 19.18	1474.	\$ 28273.	18.57	\$ 525027.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	-1018.	\$ -13688.	18.58	\$ -254325.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 0.	14.88	\$ 0.
N. TOTAL		462.	\$ 14811.		\$ 274112.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$ 843.
(1) DISCOUNT FACTOR (TABLE A)	14.88	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$ 12545.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-) (3A2+3Bd4) \$ 12545.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS\ ECONOMIC\ LIFE))$ \$ 15654.

5. SIMPLE PAYBACK PERIOD (1G/4) 7.89 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 286657.

7. SAVINGS TO INVESTMENT RATIO (SIR)=(6 / 1G)= 2.32
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 7.43 %

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=====
Estimate:      BLDG 3642          Date:      23-Nov-94
Description:   INSTALL INFARED HEATING SYSTEM COST ESTIMATE
Project:      LIMITED EEAP(HGR) Bid Date:
Location:     FORT BRAGG, N.C.  Job #:      94013.04
Sq. footage:  *****          City indx:Raleigh, NC
=====

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Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0205541750	PAVEMENT REMOVAL, BITUMINOUS, 4" TO 6" THICK					30.00 S.Y.	
Unit values		0.10	0.00	1.73	2.50	0.00	4.23
Totals		2.85	\$0	\$52	\$75	\$0	\$127
0205543200	SITE REMOVAL, STEEL PIPE, WELDED CONNECTION, UP TO 4" DIAMETER					1600.00 L.F.	
Unit values		0.15	0.00	2.61	1.06	0.00	3.68
Totals		240.00	\$0	\$4,180	\$1,702	\$0	\$5,882
0207180380	HVAC DEMO, BOILER GAS/OIL STL >150MBH					(qty) Ea.	
Unit values		12.00	0.00	268.07	0.00	0.00	268.07
Totals		0.00	\$0	\$0	\$0	\$0	\$0
0207183600	HVAC DEMO, MECH EQPT HEAVY ITEM					1.50 Ton	
Unit values		14.55	0.00	314.87	0.00	0.00	314.87
Totals		21.82	\$0	\$472	\$0	\$0	\$472
0208400600	REMOVE PIPE INSULATION UP TO 4" DIAMETER PIPE					1400.00 L.F.	
Unit values		0.07	0.00	1.63	0.20	0.00	1.83
Totals		99.40	\$0	\$2,287	\$274	\$0	\$2,561
0208401000	REMOVE INSULATION FROM PIPE FITTING, UP TO 4" DIAMETER PIPE					160.00 Ea.	
Unit values		0.20	0.00	4.60	0.56	0.00	5.16
Totals		32.00	\$0	\$735	\$90	\$0	\$825
0222541900	TAMPING TRENCH B'FILL, VIBRATING PLATE, ADD					15.00 C.Y.	
Unit values		0.09	0.00	1.44	0.55	0.00	1.99
Totals		1.34	\$0	\$22	\$8	\$0	\$30
0222582800	TRENCH EXCVTNG 40HP CHNTRNCHR&BKFL 12"W24"D					200.00 L.F.	
Unit values		0.01	0.00	0.20	0.20	0.00	0.39
Totals		2.00	\$0	\$39	\$39	\$0	\$78
0251040380	ASPHALTIC CONCRETE PAVEMENT, PAVING, WEARING						

	COURSE, 2" THICK				30.00 S.Y.	
Unit values	0.02	2.96	0.27	0.25	0.00	3.48
Totals	0.45	\$89	\$8	\$7	\$0	\$104

0260120200	BEDDING, FOR PIPE IN TRENCH SAND, DEAD OR BANK				8.00 C.Y.	
Unit values	0.16	3.79	2.79	1.13	0.00	7.71
Totals	1.28	\$30	\$22	\$9	\$0	\$61

0260120500	BEDDING, PLACING IN TRENCH				8.00 C.Y.	
Unit values	0.09	0.00	1.44	0.55	0.00	1.99
Totals	0.71	\$0	\$12	\$4	\$0	\$16

0266907800	CUT IN VALVES, W/DUCK TIP GASKET, 4" DIAMETER				1.00 Ea.	
Unit values	1.56	404.00	29.36	4.89	0.00	438.25
Totals	1.56	\$404	\$29	\$5	\$0	\$438

0268520150	GAS SERVICE & DISTRIB PIPING, POLYETHYLENE, 60-PSI 1-1/4" DIAM SDR 10, COIL				210.00 L.F.	
Unit values	0.06	0.63	1.10	0.00	0.00	1.72
Totals	12.60	\$132	\$231	\$0	\$0	\$363

0268520600	GAS SERVICE&DISTRIB PIPING, SCH40 STEEL PLAIN END, TAR COAT&WRAP 1-1/4" DIAM				50.00 L.F.	
Unit values	0.11	3.40	2.63	0.15	0.00	6.19
Totals	5.70	\$170	\$131	\$8	\$0	\$309

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=====
Line #      Description
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      Manhours  Matl    Labor  Equipment  Sub    Total
=====
U02 SITEWORK      422      $825    $8,220    $2,221      $0    $11,266

1554510245      HTG CO-RAY-VAC INFA-RD UNT GAS ELEC IGN
      (See Attached Estimate for details)      1.00 LS
Unit values      0.00      0.00      0.00    50923.00      0.00    50923.00
Totals      0.00      $0      $0    $50,923      $0    $50,923

1562600137      GAS APPLIANCE REGULATORS DOUBLE DIAPHRAGM
      TYPE 1-1/4" PIPE SIZE      1.00 Ea.
Unit values      0.53    225.77      9.14      0.00      0.00    234.91
Totals      0.53    $226      $9      $0      $0    $235

U15 MECHANICAL      1      $226      $9    $50,923      $0    $51,158
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=====
Line #      Description
-----
      Manhours   Matl    Labor   Equipment   Sub    Total
=====
```

ESTIMATE TOTAL	423	\$1,051	\$8,229	\$53,144	\$0	\$62,424
SALES TAX	0.00%	\$0				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$1,051	\$8,229	\$53,144	\$0	\$62,424
CONTINGENCY	20.00%					\$12,485
BOND	0.00%					\$0
PROFIT	10.00%					\$6,242
JOB TOTAL						\$81,151

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=====
Estimate:      BLDG  3642      Date:      23-Nov-94
Description:   INSTALL INFARED HEATING SYSTEM COST ESTIMATE
Project:      LIMITED EEAP(HGR) Bid Date:
Location:     FORT BRAGG, N.C.  Job #:      94013.04
Sq. footage:  *****      City indx:Raleigh, NC
=====

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SUMMARY

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Manhours  Matl  Labor  Equipment  Sub  Total
=====
U02 SITEWORK      422    $825    $8,220    $2,221    $0    $11,266
U15 MECHANICAL     1    $226      $9    $50,923    $0    $51,158
TOTAL             423    $1,051    $8,229    $53,144    $0    $62,424

SALES TAX          0.00%      $0
MATL MARKUP        0.00%      $0
LABOR MARKUP       0.00%      $0
EQUIPT MARKUP      0.00%      $0
SUB MARKUP         0.00%      $0

TOTAL BEFORE CONTINGENC $1,051    $8,229    $53,144    $0    $62,424
CONTINGENCY        20.00%      $12,485
BOND               0.00%      $0
PROFIT            10.00%      $6,242

JOB TOTAL                                     $81,151

```

LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 3807EO2A
LCCID FY95 (92)

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 94013.04 LES: ECO2 - NAT GAS INFRARED HEAT

FISCAL YEAR 95 DISCRETE PORTION NAME: ECO

ANALYSIS DATE: 12-12-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	156150.	
B. SIOH	\$	7808.	
C. DESIGN COST	\$	7808.	
D. TOTAL COST (1A+1B+1C)	\$	171766.	
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.	
F. PUBLIC UTILITY COMPANY REBATE	\$	0.	
G. TOTAL INVESTMENT (1D - 1E - 1F)			\$ 171766.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH (1)	SAVINGS MWH/YR (2)	ANNUAL \$ SAVINGS (3)	DISCOUNT FACTOR (4)	DISCOUNTED SAVINGS (5)
A. ELECT	\$ 34.95	19.	\$ 664.	15.08	\$ 10009.
B. DIST	\$ 19.18	2401.	\$ 46042.	18.57	\$ 855000.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	-1438.	\$ -19322.	18.58	\$ -359001.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 0.	14.88	\$ 0.
N. TOTAL		982.	\$ 27384.		\$ 506008.

3. NON ENERGY SAVINGS (+) / COST (-)

A. ANNUAL RECURRING (+/-)		\$ 100.
(1) DISCOUNT FACTOR (TABLE A)	14.88	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$ 1488.

B. NON RECURRING SAVINGS (+) / COSTS (-)

ITEM	SAVINGS (+) COST (-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS (+) / COST (-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS (+) / COST (-) (3A2+3Bd4) \$ 1488.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ 27484.

5. SIMPLE PAYBACK PERIOD (1G/4) 6.25 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 507496.

7. SAVINGS TO INVESTMENT RATIO (SIR) = (6 / 1G) = 2.95
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 8.73 %

LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 3807EO2B

LCCID FY95 (92)

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 94013.04 LES: ECO2 - NAT GAS INFRARED HEAT

FISCAL YEAR 95 DISCRETE PORTION NAME: ECO

ANALYSIS DATE: 12-12-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	187285.		
B. SIOH	\$	9364.		
C. DESIGN COST	\$	9364.		
D. TOTAL COST (1A+1B+1C)	\$	206013.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.		
F. PUBLIC UTILITY COMPANY REBATE	\$	0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$			206013.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	19.	\$ 664.	15.08	\$ 10009.
B. DIST	\$ 19.18	2401.	\$ 46042.	18.57	\$ 855000.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	-1438.	\$ -19322.	18.58	\$ -359001.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 0.	14.88	\$ 0.
N. TOTAL		982.	\$ 27384.		\$ 506008.

3. NON ENERGY SAVINGS (+) / COST (-)

A. ANNUAL RECURRING (+/-)		\$	100.
(1) DISCOUNT FACTOR (TABLE A)		14.88	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$	1488.

B. NON RECURRING SAVINGS (+) / COSTS (-)

ITEM	SAVINGS (+) COST (-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS (+) / COST (-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS (+) / COST (-) (3A2+3Bd4) \$ 1488.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS\ ECONOMIC\ LIFE))$ \$ 27484.

5. SIMPLE PAYBACK PERIOD (1G/4) 7.50 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 507496.

7. SAVINGS TO INVESTMENT RATIO (SIR) = (6 / 1G) = 2.46
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 7.75 %

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=====
Estimate:      BLDG 3807          Date:      23-Nov-94
Description:    INSTALL INFARED HEATING SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG, N.C.  Job #:      94013.04
Sq. footage:   *****          City indx:Raleigh, NC
=====

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Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0205541750	PAVEMENT REMOVAL, BITUMINOUS, 4" TO 6" THICK					40.00 S.Y.	
Unit values		0.10	0.00	1.73	2.50	0.00	4.23
Totals		3.80	\$0	\$69	\$100	\$0	\$169
0205543200	SITE REMOVAL, STEEL PIPE, WELDED CONNECTION, UP TO 4" DIAMETER					3000.00 L.F.	
Unit values		0.15	0.00	2.61	1.06	0.00	3.68
Totals		450.00	\$0	\$7,838	\$3,191	\$0	\$11,029
0207183600	HVAC DEMO, MECH EQPT HEAVY ITEM					3.00 Ton	
Unit values		14.55	0.00	314.87	0.00	0.00	314.87
Totals		43.64	\$0	\$945	\$0	\$0	\$945
0208400600	REMOVE PIPE INSULATION UP TO 4" DIAMETER PIPE					3000.00 L.F.	
Unit values		0.07	0.00	1.63	0.20	0.00	1.83
Totals		213.00	\$0	\$4,902	\$587	\$0	\$5,489
0208401000	REMOVE INSULATION FROM PIPE FITTING, UP TO 4" DIAMETER PIPE					400.00 Ea.	
Unit values		0.20	0.00	4.60	0.56	0.00	5.16
Totals		80.00	\$0	\$1,838	\$225	\$0	\$2,063
0222541900	TAMPING TRENCH B'FILL, VIBRATING PLATE, ADD					50.00 C.Y.	
Unit values		0.09	0.00	1.44	0.55	0.00	1.99
Totals		4.45	\$0	\$72	\$28	\$0	\$100
0222582800	TRENCH EXCVTNG 40HP CHNTRNCHR&BKFL 12"W24"D					600.00 L.F.	
Unit values		0.01	0.00	0.20	0.20	0.00	0.39
Totals		6.00	\$0	\$117	\$117	\$0	\$234
0251040380	ASPHALTIC CONCRETE PAVEMENT, PAVING, WEARING COURSE, 2" THICK					40.00 S.Y.	
Unit values		0.02	2.96	0.27	0.25	0.00	3.48
Totals		0.60	\$118	\$11	\$10	\$0	\$139

0260120200	BEDDING, FOR PIPE IN TRENCH SAND, DEAD OR BANK					10.00 C.Y.	
Unit values	0.16	3.79	2.79	1.13	0.00	7.71	
Totals	1.60	\$38	\$28	\$11	\$0	\$77	
0260120500	BEDDING, PLACING IN TRENCH					10.00 C.Y.	
Unit values	0.09	0.00	1.44	0.55	0.00	1.99	
Totals	0.89	\$0	\$14	\$6	\$0	\$20	
0266907800	CUT IN VALVES, W/DUCK TIP GASKET, 4" DIAMETER					1.00 Ea.	
Unit values	1.56	404.00	29.36	4.89	0.00	438.25	
Totals	1.56	\$404	\$29	\$5	\$0	\$438	
0268520150	GAS SERVICE & DISTRIB PIPING, POLYETHYLENE, 60-PSI 1-1/4" DIAM SDR 10, COIL					610.00 L.F.	
Unit values	0.06	0.63	1.10	0.00	0.00	1.72	
Totals	36.60	\$382	\$670	\$0	\$0	\$1,052	
0268520600	GAS SERVICE&DISTRIB PIPING, SCH40 STEEL PLAIN END, TAR COAT&WRAP 1-1/4" DIAM					50.00 L.F.	
Unit values	0.11	3.40	2.63	0.15	0.00	6.19	
Totals	5.70	\$170	\$131	\$8	\$0	\$309	

=====						
Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
U02 SITEWORK	848	\$1,112	\$16,664	\$4,288	\$0	\$22,064
1531106180	WTR HTR CML 100<R GAS 200 MBH 192 GPH REUSE EXISTING VENT					
Unit values	13.33	2097.90	226.88	0.00	1.00 Ea.	2324.78
Totals	13.33	\$2,098	\$227	\$0	\$0	\$2,325
1551153320	HTG BR GAS CI STD HTWR GOP 2000 MBH					
Unit values	84.21	12487.50	1376.38	0.00	1.00 Ea.	13863.88
Totals	84.21	\$12,488	\$1,376	\$0	\$0	\$13,864
1554510245	HTG CO-RAY-VAC INFA-RD UNT GAS ELEC IGN (See Attached Estimate for details)					
Unit values	0.00	0.00	0.00	81627.00	1.00 LS	81627.00
Totals	0.00	\$0	\$0	\$81,627	\$0	\$81,627
1562600137	GAS APPLIANCE REGULATORS DOUBLE DIAPHRAGM TYPE 1-1/4" PIPE SIZE					
Unit values	0.53	225.77	9.14	0.00	1.00 Ea.	234.91
Totals	0.53	\$226	\$9	\$0	\$0	\$235
U15 MECHANICAL	99	\$14,812	\$1,612	\$81,627	\$0	\$98,051

```
=====
Line #      Description
-----
      Manhours   Matl    Labor   Equipment   Sub    Total
=====
```

ESTIMATE TOTAL	947	\$15,924	\$18,276	\$85,915	\$0	\$120,115
SALES TAX	0.00%	\$0				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$15,924	\$18,276	\$85,915	\$0	\$120,115
CONTINGENCY	20.00%					\$24,023
BOND	0.00%					\$0
PROFIT	10.00%					\$12,012
JOB TOTAL						\$156,150

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Estimate:      BLDG 3807      Date:      23-Nov-94
Description:   INSTALL INFARED HEATING SYSTEM COST ESTIMATE
Project:      LIMITED EEAP(HGR) Bid Date:
Location:     FORT BRAGG, N.C. Job #:      94013.04
Sq. footage:  *****      City indx:Raleigh, NC
=====

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SUMMARY

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-----
Manhours  Matl  Labor  Equipment  Sub  Total
=====
U02 SITEWORK      848    $1,112    $16,664    $4,288      $0    $22,064
U15 MECHANICAL    99     $14,812    $1,612    $81,627     $0    $98,051
TOTAL             947    $15,924    $18,276    $85,915     $0    $120,115

SALES TAX          0.00%      $0
MATL MARKUP        0.00%      $0
LABOR MARKUP       0.00%      $0
EQUIPT MARKUP      0.00%      $0
SUB MARKUP         0.00%      $0

TOTAL BEFORE CONTINGENC  $15,924    $18,276    $85,915     $0    $120,115
CONTINGENCY          20.00%      $24,023
BOND                  0.00%      $0
PROFIT               10.00%      $12,012

JOB TOTAL                                     $156,150

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LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 3954EC2A

LCCID FY95 (92)

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 94013.04 LES: ECO2 - NAT GAS INFRARED HEAT

FISCAL YEAR 95 DISCRETE PORTION NAME: ECO

ANALYSIS DATE: 12-05-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	71897.	
B. SIOH	\$	3595.	
C. DESIGN COST	\$	3595.	
D. TOTAL COST (1A+1B+1C)	\$	79087.	
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.	
F. PUBLIC UTILITY COMPANY REBATE	\$	0.	
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$		79087.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH (1)	SAVINGS MWH/YR (2)	ANNUAL \$ SAVINGS (3)	DISCOUNT FACTOR (4)	DISCOUNTED SAVINGS (5)
A. ELECT	\$ 34.95	15.	\$ 507.	15.08	\$ 7642.
B. DIST	\$ 19.18	1055.	\$ 20227.	18.57	\$ 375616.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	-614.	\$ -8257.	18.58	\$ -153420.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 0.	14.88	\$ 0.
N. TOTAL		455.	\$ 12477.		\$ 229838.

3. NON ENERGY SAVINGS (+) / COST (-)

A. ANNUAL RECURRING (+/-)		\$ 2881.
(1) DISCOUNT FACTOR (TABLE A)	14.88	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$ 42872.

B. NON RECURRING SAVINGS (+) / COSTS (-)

ITEM	SAVINGS (+) COST (-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS (+) / COST (-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS (+) / COST (-) (3A2+3Bd4) \$ 42872.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS\ ECONOMIC\ LIFE))$ \$ 15358.

5. SIMPLE PAYBACK PERIOD (1G/4) 5.15 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 272711.

7. SAVINGS TO INVESTMENT RATIO (SIR) = (6 / 1G) = 3.45
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 9.58 %

LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 3954EO2B

LCCID FY95 (92)

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 94013.04 LES: ECO2 - NAT GAS INFRARED HEAT

FISCAL YEAR 95 DISCRETE PORTION NAME: ECO

ANALYSIS DATE: 12-05-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	103032.		
B. SIOH	\$	5152.		
C. DESIGN COST	\$	5152.		
D. TOTAL COST (1A+1B+1C)	\$	113336.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.		
F. PUBLIC UTILITY COMPANY REBATE	\$	0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$			113336.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH (1)	SAVINGS MWH/YR (2)	ANNUAL \$ SAVINGS (3)	DISCOUNT FACTOR (4)	DISCOUNTED SAVINGS (5)
A. ELECT	\$ 34.95	15.	\$ 507.	15.08	\$ 7642.
B. DIST	\$ 19.18	1055.	\$ 20227.	18.57	\$ 375616.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	-614.	\$ -8257.	18.58	\$ -153420.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 0.	14.88	\$ 0.
N. TOTAL		455.	\$ 12477.		\$ 229838.

3. NON ENERGY SAVINGS (+) / COST (-)

A. ANNUAL RECURRING (+/-)		\$	2881.
(1) DISCOUNT FACTOR (TABLE A)		14.88	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$	42872.

B. NON RECURRING SAVINGS (+) / COSTS (-)

ITEM	SAVINGS (+) COST (-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS (+) / COST (-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS (+) / COST (-) (3A2+3Bd4) \$ 42872.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS\ ECONOMIC\ LIFE))$ \$ 15358.

5. SIMPLE PAYBACK PERIOD (1G/4) 7.38 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 272711.

7. SAVINGS TO INVESTMENT RATIO (SIR) = (6 / 1G) = 2.41
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 7.62 %

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=====
Estimate:      BLDG 3954      Date:      23-Nov-94
Description:    INSTALL INFARED HEATING SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG, N.C. Job #:      94013.04
Sq. footage:   *****      City indx:Raleigh, NC
=====

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Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0205541750	PAVEMENT REMOVAL, BITUMINOUS, 4" TO 6" THICK					30.00 S.Y.	
Unit values		0.10	0.00	1.73	2.50	0.00	4.23
Totals		2.85	\$0	\$52	\$75	\$0	\$127
0205543200	SITE REMOVAL, STEEL PIPE, WELDED CONNECTION, UP TO 4" DIAMETER					1600.00 L.F.	
Unit values		0.15	0.00	2.61	1.06	0.00	3.68
Totals		240.00	\$0	\$4,180	\$1,702	\$0	\$5,882
0207180380	HVAC DEMO, BOILER GAS/OIL STL >150MBH					(qty) Ea.	
Unit values		12.00	0.00	268.07	0.00	0.00	268.07
Totals		0.00	\$0	\$0	\$0	\$0	\$0
0207183600	HVAC DEMO, MECH EQPT HEAVY ITEM					1.50 Ton	
Unit values		14.55	0.00	314.87	0.00	0.00	314.87
Totals		21.82	\$0	\$472	\$0	\$0	\$472
0208400600	REMOVE PIPE INSULATION UP TO 4" DIAMETER PIPE					1400.00 L.F.	
Unit values		0.07	0.00	1.63	0.20	0.00	1.83
Totals		99.40	\$0	\$2,287	\$274	\$0	\$2,561
0208401000	REMOVE INSULATION FROM PIPE FITTING, UP TO 4" DIAMETER PIPE					160.00 Ea.	
Unit values		0.20	0.00	4.60	0.56	0.00	5.16
Totals		32.00	\$0	\$735	\$90	\$0	\$825
0222541900	TAMPING TRENCH B'FILL, VIBRATING PLATE, ADD					15.00 C.Y.	
Unit values		0.09	0.00	1.44	0.55	0.00	1.99
Totals		1.34	\$0	\$22	\$8	\$0	\$30
0222582800	TRENCH EXCVTNG 40HP CHNTRNCHR&BKFL 12"W24"D					200.00 L.F.	
Unit values		0.01	0.00	0.20	0.20	0.00	0.39
Totals		2.00	\$0	\$39	\$39	\$0	\$78
0251040380	ASPHALTIC CONCRETE PAVEMENT, PAVING, WEARING						

	COURSE, 2" THICK				30.00 S.Y.	
Unit values	0.02	2.96	0.27	0.25	0.00	3.48
Totals	0.45	\$89	\$8	\$7	\$0	\$104
0260120200	BEDDING, FOR PIPE IN TRENCH SAND, DEAD OR BANK				8.00 C.Y.	
Unit values	0.16	3.79	2.79	1.13	0.00	7.71
Totals	1.28	\$30	\$22	\$9	\$0	\$61
0260120500	BEDDING, PLACING IN TRENCH				8.00 C.Y.	
Unit values	0.09	0.00	1.44	0.55	0.00	1.99
Totals	0.71	\$0	\$12	\$4	\$0	\$16
0266907800	CUT IN VALVES, W/DUCK TIP GASKET, 4" DIAMETER				1.00 Ea.	
Unit values	1.56	404.00	29.36	4.89	0.00	438.25
Totals	1.56	\$404	\$29	\$5	\$0	\$438
0268520150	GAS SERVICE & DISTRIB PIPING, POLYETHYLENE, 60-PSI 1-1/4" DIAM SDR 10, COIL				210.00 L.F.	
Unit values	0.06	0.63	1.10	0.00	0.00	1.72
Totals	12.60	\$132	\$231	\$0	\$0	\$363
0268520600	GAS SERVICE&DISTRIB PIPING, SCH40 STEEL PLAIN END, TAR COAT&WRAP 1-1/4" DIAM				50.00 L.F.	
Unit values	0.11	3.40	2.63	0.15	0.00	6.19
Totals	5.70	\$170	\$131	\$8	\$0	\$309

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Line #      Description
-----
            Manhours  Matl    Labor   Equipment   Sub    Total
=====
U02 SITEWORK      422      $825    $8,220    $2,221        $0    $11,266

1554510245      HTG CO-RAY-VAC INFA-RD UNT GAS ELEC IGN
                (See Attached Estimate for details)
Unit values      0.00      0.00      0.00    43804.00      0.00    43804.00
Totals           0.00      $0        $0      $43,804        $0    $43,804

1562600137      GAS APPLIANCE REGULATORS DOUBLE DIAPHRAGM
                TYPE 1-1/4" PIPE SIZE
Unit values      0.53     225.77      9.14      0.00      0.00     234.91
Totals           0.53     $226        $9        $0        $0      $235

U15 MECHANICAL      1      $226        $9    $43,804        $0    $44,039

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=====
Line #      Description
-----
      Manhours   Matl     Labor   Equipment   Sub     Total
=====
```

ESTIMATE TOTAL	423	\$1,051	\$8,229	\$46,025	\$0	\$55,305
SALES TAX	0.00%	\$0				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$1,051	\$8,229	\$46,025	\$0	\$55,305
CONTINGENCY	20.00%					\$11,061
BOND	0.00%					\$0
PROFIT	10.00%					\$5,531
JOB TOTAL						\$71,897

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=====
Estimate:      BLDG 3954      Date:      23-Nov-94
Description:   INSTALL INFARED HEATING SYSTEM COST ESTIMATE
Project:      LIMITED EEAP(HGR) Bid Date:
Location:     FORT BRAGG, N.C. Job #:      94013.04
Sq. footage:  *****      City indx:Raleigh, NC
=====

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SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
U02 SITEWORK	422	\$825	\$8,220	\$2,221	\$0	\$11,266
U15 MECHANICAL	1	\$226	\$9	\$43,804	\$0	\$44,039
TOTAL	423	\$1,051	\$8,229	\$46,025	\$0	\$55,305
SALES TAX	0.00%	\$0				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$1,051	\$8,229	\$46,025	\$0	\$55,305
CONTINGENCY	20.00%					\$11,061
BOND	0.00%					\$0
PROFIT	10.00%					\$5,531
JOB TOTAL						\$71,897

LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 3962EO2A

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) LCCID FY95 (92)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 94013.04 LES: ECO2 - NAT GAS INFRARED HEAT

FISCAL YEAR 95 DISCRETE PORTION NAME: ECO

ANALYSIS DATE: 12-13-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	81151.	
B. SIOH	\$	4058.	
C. DESIGN COST	\$	4058.	
D. TOTAL COST (1A+1B+1C)	\$	89267.	
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.	
F. PUBLIC UTILITY COMPANY REBATE	\$	0.	
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$		89267.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	8.	\$ 283.	15.08	\$ 4264.
B. DIST	\$ 19.18	1448.	\$ 27778.	18.57	\$ 515845.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	-978.	\$ -13148.	18.58	\$ -244281.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 0.	14.88	\$ 0.
N. TOTAL		478.	\$ 14914.		\$ 275827.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$ 4750.
(1) DISCOUNT FACTOR (TABLE A)	14.88	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$ 70684.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-) (3A2+3Bd4) \$ 70684.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ 19664.

5. SIMPLE PAYBACK PERIOD (1G/4) 4.54 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 346511.

7. SAVINGS TO INVESTMENT RATIO (SIR) = $(6 / 1G) =$ 3.88
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 10.23 %

LIFE CYCLE COST ANALYSIS SUMMARY

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) STUDY: 3962EO2B
 INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 LCCID FY95 (92)
 PROJECT NO. & TITLE: 94013.04 LES: ECO2 - NAT GAS INFRARED HEAT
 FISCAL YEAR 95 DISCRETE PORTION NAME: ECO
 ANALYSIS DATE: 12-13-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	112286.		
B. SIOH	\$	5614.		
C. DESIGN COST	\$	5614.		
D. TOTAL COST (1A+1B+1C)	\$	123514.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$		0.	
F. PUBLIC UTILITY COMPANY REBATE	\$		0.	
G. TOTAL INVESTMENT (1D - 1E - 1F)				\$ 123514.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH (1)	SAVINGS MWH/YR (2)	ANNUAL \$ SAVINGS (3)	DISCOUNT FACTOR (4)	DISCOUNTED SAVINGS (5)
A. ELECT	\$ 34.95	8.	\$ 283.	15.08	\$ 4264.
B. DIST	\$ 19.18	1448.	\$ 27778.	18.57	\$ 515845.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	-978.	\$ -13148.	18.58	\$ -244281.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 0.	14.88	\$ 0.
N. TOTAL		478.	\$ 14914.		\$ 275827.

3. NON ENERGY SAVINGS (+) / COST (-)

A. ANNUAL RECURRING (+/-)		\$ 4750.
(1) DISCOUNT FACTOR (TABLE A)	14.88	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$ 70684.

B. NON RECURRING SAVINGS (+) / COSTS (-)

ITEM	SAVINGS (+) COST (-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS (+) / COST (-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS (+) / COST (-) (3A2+3Bd4) \$ 70684.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ 19664.

5. SIMPLE PAYBACK PERIOD (1G/4) 6.28 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 346511.

7. SAVINGS TO INVESTMENT RATIO (SIR) = (6 / 1G) = 2.81
 (IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 8.45 %

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=====
Estimate:      BLDG 3962      Date:      23-Nov-94
Description:    INSTALL INFARED HEATING SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG, N.C. Job #:      94013.04
Sq. footage:   *****      City indx:Raleigh, NC
=====

```

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0205541750	PAVEMENT REMOVAL, BITUMINOUS, 4" TO 6" THICK					30.00 S.Y.	
Unit values		0.10	0.00	1.73	2.50	0.00	4.23
Totals		2.85	\$0	\$52	\$75	\$0	\$127
0205543200	SITE REMOVAL, STEEL PIPE, WELDED CONNECTION, UP TO 4" DIAMETER					1600.00 L.F.	
Unit values		0.15	0.00	2.61	1.06	0.00	3.68
Totals		240.00	\$0	\$4,180	\$1,702	\$0	\$5,882
0207180380	HVAC DEMO, BOILER GAS/OIL STL >150MBH					(qty) Ea.	
Unit values		12.00	0.00	268.07	0.00	0.00	268.07
Totals		0.00	\$0	\$0	\$0	\$0	\$0
0207183600	HVAC DEMO, MECH EQPT HEAVY ITEM					1.50 Ton	
Unit values		14.55	0.00	314.87	0.00	0.00	314.87
Totals		21.82	\$0	\$472	\$0	\$0	\$472
0208400600	REMOVE PIPE INSULATION UP TO 4" DIAMETER PIPE					1400.00 L.F.	
Unit values		0.07	0.00	1.63	0.20	0.00	1.83
Totals		99.40	\$0	\$2,287	\$274	\$0	\$2,561
0208401000	REMOVE INSULATION FROM PIPE FITTING, UP TO 4" DIAMETER PIPE					160.00 Ea.	
Unit values		0.20	0.00	4.60	0.56	0.00	5.16
Totals		32.00	\$0	\$735	\$90	\$0	\$825
0222541900	TAMPING TRENCH B'FILL, VIBRATING PLATE, ADD					15.00 C.Y.	
Unit values		0.09	0.00	1.44	0.55	0.00	1.99
Totals		1.34	\$0	\$22	\$8	\$0	\$30
0222582800	TRENCH EXCVTNG 40HP CHNTRNCHR&BKFL 12"W24"D					200.00 L.F.	
Unit values		0.01	0.00	0.20	0.20	0.00	0.39
Totals		2.00	\$0	\$39	\$39	\$0	\$78
0251040380	ASPHALTIC CONCRETE PAVEMENT, PAVING, WEARING						

	COURSE, 2" THICK				30.00 S.Y.	
Unit values	0.02	2.96	0.27	0.25	0.00	3.48
Totals	0.45	\$89	\$8	\$7	\$0	\$104
0260120200	BEDDING, FOR PIPE IN TRENCH SAND, DEAD OR BANK				8.00 C.Y.	
Unit values	0.16	3.79	2.79	1.13	0.00	7.71
Totals	1.28	\$30	\$22	\$9	\$0	\$61
0260120500	BEDDING, PLACING IN TRENCH				8.00 C.Y.	
Unit values	0.09	0.00	1.44	0.55	0.00	1.99
Totals	0.71	\$0	\$12	\$4	\$0	\$16
0266907800	CUT IN VALVES, W/DUCK TIP GASKET, 4" DIAMETER				1.00 Ea.	
Unit values	1.56	404.00	29.36	4.89	0.00	438.25
Totals	1.56	\$404	\$29	\$5	\$0	\$438
0268520150	GAS SERVICE & DISTRIB PIPING, POLYETHYLENE, 60-PSI 1-1/4" DIAM SDR 10, COIL				210.00 L.F.	
Unit values	0.06	0.63	1.10	0.00	0.00	1.72
Totals	12.60	\$132	\$231	\$0	\$0	\$363
0268520600	GAS SERVICE&DISTRIB PIPING, SCH40 STEEL PLAIN END, TAR COAT&WRAP 1-1/4" DIAM				50.00 L.F.	
Unit values	0.11	3.40	2.63	0.15	0.00	6.19
Totals	5.70	\$170	\$131	\$8	\$0	\$309

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=====
Line #      Description
-----
              Manhours   Matl      Labor   Equipment   Sub      Total
=====
U02 SITEWORK      422      $825    $8,220    $2,221        $0    $11,266

1554510245      HTG CO-RAY-VAC INFA-RD UNT GAS ELEC IGN
              (See Attached Estimate for details)
Unit values      0.00      0.00      0.00    50923.00      0.00    50923.00
Totals           0.00      $0        $0     $50,923        $0     $50,923

1562600137      GAS APPLIANCE REGULATORS DOUBLE DIAPHRAGM
              TYPE 1-1/4" PIPE SIZE
Unit values      0.53     225.77      9.14      0.00      0.00     234.91
Totals           0.53     $226        $9        $0        $0        $235

U15 MECHANICAL      1      $226        $9     $50,923        $0    $51,158
=====
```

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=====
Line #      Description
-----
      Manhours  Matl    Labor  Equipment  Sub    Total
=====
```

ESTIMATE TOTAL	423	\$1,051	\$8,229	\$53,144	\$0	\$62,424
SALES TAX	0.00%	\$0				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$1,051	\$8,229	\$53,144	\$0	\$62,424
CONTINGENCY	20.00%					\$12,485
BOND	0.00%					\$0
PROFIT	10.00%					\$6,242
JOB TOTAL						\$81,151


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Estimate:      BLDG 3962          Date:      23-Nov-94
Description:   INSTALL INFARED HEATING SYSTEM COST ESTIMATE
Project:      LIMITED EEAP(HGR) Bid Date:
Location:     FORT BRAGG, N.C.  Job #:      94013.04
Sq. footage:  *****          City indx:Raleigh, NC
=====

```

SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
U02 SITEWORK	422	\$825	\$8,220	\$2,221	\$0	\$11,266
U15 MECHANICAL	1	\$226	\$9	\$50,923	\$0	\$51,158
TOTAL	423	\$1,051	\$8,229	\$53,144	\$0	\$62,424
SALES TAX	0.00%	\$0				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$1,051	\$8,229	\$53,144	\$0	\$62,424
CONTINGENCY	20.00%					\$12,485
BOND	0.00%					\$0
PROFIT	10.00%					\$6,242
JOB TOTAL						\$81,151

LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 4137EO2A

LCCID FY95 (92)

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 94013.04 LES: ECO2 - NAT GAS INFRARED HEAT

FISCAL YEAR 95 DISCRETE PORTION NAME: ECO

ANALYSIS DATE: 12-05-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	56824.	
B. SIOH	\$	2841.	
C. DESIGN COST	\$	2841.	
D. TOTAL COST (1A+1B+1C)	\$	62506.	
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.	
F. PUBLIC UTILITY COMPANY REBATE	\$	0.	
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$		62506.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR (2)	ANNUAL \$ SAVINGS (3)	DISCOUNT FACTOR (4)	DISCOUNTED SAVINGS (5)
A. ELECT	\$ 34.95	26.	\$ 920.	15.08	\$ 13872.
B. DIST	\$ 19.18	1048.	\$ 20095.	18.57	\$ 373169.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	-573.	\$ -7700.	18.58	\$ -143057.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 0.	14.88	\$ 0.
N. TOTAL		501.	\$ 13316.		\$ 243984.

3. NON ENERGY SAVINGS (+) / COST (-)

A. ANNUAL RECURRING (+/-)		\$	1339.
(1) DISCOUNT FACTOR (TABLE A)	14.88		
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$	19923.

B. NON RECURRING SAVINGS (+) / COSTS (-)

ITEM	SAVINGS (+) COST (-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS (+) / COST (-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS (+) / COST (-) (3A2+3Bd4) \$ 19923.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS\ ECONOMIC\ LIFE))$ \$ 14655.

5. SIMPLE PAYBACK PERIOD (1G/4) 4.27 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 263907.

7. SAVINGS TO INVESTMENT RATIO (SIR) = $(6 / 1G) =$ 4.22
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 10.69 %

LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 4137EO2B

LCCID FY95 (92)

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 94013.04 LES: ECO2 - NAT GAS INFRARED HEAT

FISCAL YEAR 95 DISCRETE PORTION NAME: ECO

ANALYSIS DATE: 12-05-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	87959.		
B. SIOH	\$	4398.		
C. DESIGN COST	\$	4398.		
D. TOTAL COST (1A+1B+1C)	\$	96755.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.		
F. PUBLIC UTILITY COMPANY REBATE	\$	0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$			96755.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	26.	\$ 920.	15.08	\$ 13872.
B. DIST	\$ 19.18	1048.	\$ 20095.	18.57	\$ 373169.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	-573.	\$ -7700.	18.58	\$ -143057.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 0.	14.88	\$ 0.
N. TOTAL		501.	\$ 13316.		\$ 243984.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$ 1339.
(1) DISCOUNT FACTOR (TABLE A)	14.88	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$ 19923.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-) (3A2+3Bd4) \$ 19923.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS\ ECONOMIC\ LIFE))$ \$ 14655.

5. SIMPLE PAYBACK PERIOD (1G/4) 6.60 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 263907.

7. SAVINGS TO INVESTMENT RATIO (SIR) = $(6 / 1G) =$ 2.73
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 8.30 %

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=====
Estimate:      BLDG 4137          Date:      23-Nov-94
Description:   INSTALL INFARED HEATING SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG, N.C.  Job #:      94013.04
Sq. footage:   *****          City indx:Raleigh, NC
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Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0205541750	PAVEMENT REMOVAL, BITUMINOUS, 4" TO 6" THICK					20.00 S.Y.	
Unit values		0.10	0.00	1.73	2.50	0.00	4.23
Totals		1.90	\$0	\$35	\$50	\$0	\$85
0205543200	SITE REMOVAL, STEEL PIPE, WELDED CONNECTION, UP TO 4" DIAMETER					1000.00 L.F.	
Unit values		0.15	0.00	2.61	1.06	0.00	3.68
Totals		150.00	\$0	\$2,613	\$1,064	\$0	\$3,677
0207180380	HVAC DEMO, BOILER GAS/OIL STL >150MBH					(qty) Ea.	
Unit values		12.00	0.00	268.07	0.00	0.00	268.07
Totals		0.00	\$0	\$0	\$0	\$0	\$0
0207183600	HVAC DEMO, MECH EQPT HEAVY ITEM					1.00 Ton	
Unit values		14.55	0.00	314.87	0.00	0.00	314.87
Totals		14.55	\$0	\$315	\$0	\$0	\$315
0208400600	REMOVE PIPE INSULATION UP TO 4" DIAMETER PIPE					1000.00 L.F.	
Unit values		0.07	0.00	1.63	0.20	0.00	1.83
Totals		71.00	\$0	\$1,634	\$196	\$0	\$1,830
0208401000	REMOVE INSULATION FROM PIPE FITTING, UP TO 4" DIAMETER PIPE					125.00 Ea.	
Unit values		0.20	0.00	4.60	0.56	0.00	5.16
Totals		25.00	\$0	\$574	\$70	\$0	\$644
0222541900	TAMPING TRENCH B'FILL, VIBRATING PLATE, ADD					15.00 C.Y.	
Unit values		0.09	0.00	1.44	0.55	0.00	1.99
Totals		1.34	\$0	\$22	\$8	\$0	\$30
0222582800	TRENCH EXCVTNG 40HP CHNTRNCHR&BKFL 12"W24"D					150.00 L.F.	
Unit values		0.01	0.00	0.20	0.20	0.00	0.39
Totals		1.50	\$0	\$29	\$29	\$0	\$58
0251040380	ASPHALTIC CONCRETE PAVEMENT, PAVING, WEARING						

	COURSE, 2" THICK					20.00 S.Y.	
Unit values	0.02	2.96	0.27	0.25	0.00	3.48	
Totals	0.30	\$59	\$5	\$5	\$0	\$69	
0260120200	BEDDING, FOR PIPE IN TRENCH SAND, DEAD OR BANK					2.50 C.Y.	
Unit values	0.16	3.79	2.79	1.13	0.00	7.71	
Totals	0.40	\$9	\$7	\$3	\$0	\$19	
0260120500	BEDDING, PLACING IN TRENCH					2.50 C.Y.	
Unit values	0.09	0.00	1.44	0.55	0.00	1.99	
Totals	0.22	\$0	\$4	\$1	\$0	\$5	
0266907800	CUT IN VALVES, W/DUCK TIP GASKET, 4" DIAMETER					1.00 Ea.	
Unit values	1.56	404.00	29.36	4.89	0.00	438.25	
Totals	1.56	\$404	\$29	\$5	\$0	\$438	
0268520150	GAS SERVICE & DISTRIB PIPING, POLYETHYLENE, 60-PSI 1-1/4" DIAM SDR 10, COIL					160.00 L.F.	
Unit values	0.06	0.63	1.10	0.00	0.00	1.72	
Totals	9.60	\$100	\$176	\$0	\$0	\$276	
0268520600	GAS SERVICE&DISTRIB PIPING, SCH40 STEEL PLAIN END, TAR COAT&WRAP 1-1/4" DIAM					50.00 L.F.	
Unit values	0.11	3.40	2.63	0.15	0.00	6.19	
Totals	5.70	\$170	\$131	\$8	\$0	\$309	

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Line #      Description
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              Manhours   Matl      Labor    Equipment   Sub      Total
=====
U02 SITEWORK      284      $742    $5,574    $1,439      $0    $7,755

1554510245      HTG CO-RAY-VAC INFA-RD UNT GAS ELEC IGN
              (See Attached Estimate for details)
Unit values      0.00      0.00      0.00    35721.00    0.00    35721.00
Totals           0.00      $0        $0      $35,721     $0    $35,721

1562600137      GAS APPLIANCE REGULATORS DOUBLE DIAPHRAGM
              TYPE 1-1/4" PIPE SIZE
Unit values      0.53      225.77      9.14      0.00    0.00    234.91
Totals           0.53      $226      $9        $0        $0    $235

U15 MECHANICAL      1      $226      $9      $35,721     $0    $35,956
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=====
Line #      Description
-----
      Manhours  Matl    Labor  Equipment  Sub    Total
=====
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ESTIMATE TOTAL	285	\$968	\$5,583	\$37,160	\$0	\$43,711
SALES TAX	0.00%	\$0				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$968	\$5,583	\$37,160	\$0	\$43,711
CONTINGENCY	20.00%					\$8,742
BOND	0.00%					\$0
PROFIT	10.00%					\$4,371
JOB TOTAL						\$56,824

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Estimate:      BLDG  4137      Date:      23-Nov-94
Description:    INSTALL INFARED HEATING SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG, N.C. Job #:      94013.04
Sq. footage:   *****      City indx:Raleigh, NC
=====

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SUMMARY

	Manhours	Matl	Labor	Equipment	Sub	Total
U02 SITEWORK	284	\$742	\$5,574	\$1,439	\$0	\$7,755
U15 MECHANICAL	1	\$226	\$9	\$35,721	\$0	\$35,956
TOTAL	285	\$968	\$5,583	\$37,160	\$0	\$43,711
SALES TAX	0.00%	\$0				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$968	\$5,583	\$37,160	\$0	\$43,711
CONTINGENCY	20.00%					\$8,742
BOND	0.00%					\$0
PROFIT	10.00%					\$4,371
JOB TOTAL						\$56,824

LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 4242EO2A

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) LCCID FY95 (92)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 94013.04 LES: ECO2 - NAT GAS INFRARED HEAT

FISCAL YEAR 95 DISCRETE PORTION NAME: ECO

ANALYSIS DATE: 12-12-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	43932.		
B. SIOH	\$	2197.		
C. DESIGN COST	\$	2197.		
D. TOTAL COST (1A+1B+1C)	\$	48326.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.		
F. PUBLIC UTILITY COMPANY REBATE	\$	0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$		48326.	

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH (1)	SAVINGS MWH/YR (2)	ANNUAL \$ SAVINGS (3)	DISCOUNT FACTOR (4)	DISCOUNTED SAVINGS (5)
A. ELECT	\$ 34.95	17.	\$ 603.	15.08	\$ 9097.
B. DIST	\$ 19.18	682.	\$ 13076.	18.57	\$ 242828.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	-372.	\$ -5000.	18.58	\$ -92907.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 0.	14.88	\$ 0.
N. TOTAL		327.	\$ 8679.		\$ 159018.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$ 3421.
(1) DISCOUNT FACTOR (TABLE A)	14.88	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$ 50900.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS (+) COST (-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS (+) / COST (-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+) / COST(-) (3A2+3Bd4) \$ 50900.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS\ ECONOMIC\ LIFE))$ \$ 12100.

5. SIMPLE PAYBACK PERIOD (1G/4) 3.99 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 209918.

7. SAVINGS TO INVESTMENT RATIO (SIR) = $(6 / 1G) =$ 4.34
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 10.85 %

LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 4242EO2B

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) LCCID FY95 (92)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 94013.04 LES: ECO2 - NAT GAS INFRARED HEAT

FISCAL YEAR 95 DISCRETE PORTION NAME: ECO

ANALYSIS DATE: 12-12-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	75067.		
B. SIOH	\$	3753.		
C. DESIGN COST	\$	3753.		
D. TOTAL COST (1A+1B+1C)	\$	82573.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.		
F. PUBLIC UTILITY COMPANY REBATE	\$	0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$			82573.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	17.	\$ 603.	15.08	\$ 9097.
B. DIST	\$ 19.18	682.	\$ 13076.	18.57	\$ 242828.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	-372.	\$ -5000.	18.58	\$ -92907.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 0.	14.88	\$ 0.
N. TOTAL		327.	\$ 8679.		\$ 159018.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$ 3421.
(1) DISCOUNT FACTOR (TABLE A)	14.88	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$ 50900.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+) COST(-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-) (3A2+3Bd4) \$ 50900.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ 12100.

5. SIMPLE PAYBACK PERIOD (1G/4) 6.82 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 209918.

7. SAVINGS TO INVESTMENT RATIO (SIR) = $(6 / 1G) =$ 2.54
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 7.92 %

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Estimate:      BLDG  4242      Date:      23-Nov-94
Description:    INSTALL INFARED HEATING SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG, N.C. Job #:      94013.04
Sq. footage:   6000.00      City indx:Raleigh, NC
=====

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Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0205541750	PAVEMENT REMOVAL, BITUMINOUS, 4" TO 6" THICK						
						20.00 S.Y.	
Unit values		0.10	0.00	1.73	2.50	0.00	4.23
Totals		1.90	\$0	\$35	\$50	\$0	\$85
0205543200	SITE REMOVAL, STEEL PIPE, WELDED CONNECTION, UP TO 4" DIAMETER					500.00 L.F.	
Unit values		0.15	0.00	2.61	1.06	0.00	3.68
Totals		75.00	\$0	\$1,306	\$532	\$0	\$1,838
0207180380	HVAC DEMO, BOILER GAS/OIL STL >150MBH					1.00 Ea.	
Unit values		12.00	0.00	268.07	0.00	0.00	268.07
Totals		12.00	\$0	\$268	\$0	\$0	\$268
0207183600	HVAC DEMO, MECH EQPT HEAVY ITEM					0.50 Ton	
Unit values		14.55	0.00	314.87	0.00	0.00	314.87
Totals		7.27	\$0	\$157	\$0	\$0	\$157
0208400600	REMOVE PIPE INSULATION UP TO 4" DIAMETER PIPE					500.00 L.F.	
Unit values		0.07	0.00	1.63	0.20	0.00	1.83
Totals		35.50	\$0	\$817	\$98	\$0	\$915
0208401000	REMOVE INSULATION FROM PIPE FITTING, UP TO 4" DIAMETER PIPE					75.00 Ea.	
Unit values		0.20	0.00	4.60	0.56	0.00	5.16
Totals		15.00	\$0	\$345	\$42	\$0	\$387
0222541900	TAMPING TRENCH B'FILL, VIBRATING PLATE, ADD					15.00 C.Y.	
Unit values		0.09	0.00	1.44	0.55	0.00	1.99
Totals		1.34	\$0	\$22	\$8	\$0	\$30
0222582800	TRENCH EXCVTNG 40HP CHNTRNCHR&BKFL 12"W24"D					150.00 L.F.	
Unit values		0.01	0.00	0.20	0.20	0.00	0.39
Totals		1.50	\$0	\$29	\$29	\$0	\$58
0251040380	ASPHALTIC CONCRETE PAVEMENT, PAVING, WEARING						

	COURSE, 2" THICK				20.00 S.Y.	
Unit values	0.02	2.96	0.27	0.25	0.00	3.48
Totals	0.30	\$59	\$5	\$5	\$0	\$69

0260120200	BEDDING, FOR PIPE IN TRENCH SAND, DEAD OR BANK				2.50 C.Y.	
Unit values	0.16	3.79	2.79	1.13	0.00	7.71
Totals	0.40	\$9	\$7	\$3	\$0	\$19

0260120500	BEDDING, PLACING IN TRENCH				2.50 C.Y.	
Unit values	0.09	0.00	1.44	0.55	0.00	1.99
Totals	0.22	\$0	\$4	\$1	\$0	\$5

0266907800	CUT IN VALVES, W/DUCK TIP GASKET, 4" DIAMETER				1.00 Ea.	
Unit values	1.56	404.00	29.36	4.89	0.00	438.25
Totals	1.56	\$404	\$29	\$5	\$0	\$438

0268520150	GAS SERVICE & DISTRIB PIPING, POLYETHYLENE, 60-PSI 1-1/4" DIAM SDR 10, COIL				160.00 L.F.	
Unit values	0.06	0.63	1.10	0.00	0.00	1.72
Totals	9.60	\$100	\$176	\$0	\$0	\$276

0268520600	GAS SERVICE&DISTRIB PIPING, SCH40 STEEL PLAIN END, TAR COAT&WRAP 1-1/4" DIAM				50.00 L.F.	
Unit values	0.11	3.40	2.63	0.15	0.00	6.19
Totals	5.70	\$170	\$131	\$8	\$0	\$309

=====						
Line #	Description					

	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
U02 SITEWORK	168	\$742	\$3,331	\$781	\$0	\$4,854
1551153320	HTG BR GAS CI STD HTWR GOP 2000 MBH					
					1.00 Ea.	
Unit values	84.21	12487.50	1376.38	0.00	0.00	13863.88
Totals	84.21	\$12,488	\$1,376	\$0	\$0	\$13,864
1554510245	HTG CO-RAY-VAC INFA-RD UNT GAS ELEC IGN					
	(See Attached Estimate for details)				1.00 LS	
Unit values	0.00	0.00	0.00	14841.00	0.00	14841.00
Totals	0.00	\$0	\$0	\$14,841	\$0	\$14,841
1562600137	GAS APPLIANCE REGULATORS DOUBLE DIAPHRAGM					
	TYPE 1-1/4" PIPE SIZE				1.00 Ea.	
Unit values	0.53	225.77	9.14	0.00	0.00	234.91
Totals	0.53	\$226	\$9	\$0	\$0	\$235
U15 MECHANICAL	85	\$12,714	\$1,385	\$14,841	\$0	\$28,940

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=====
Line #      Description
-----
              Manhours   Matl     Labor   Equipment   Sub     Total
=====
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ESTIMATE TOTAL	253	\$13,456	\$4,716	\$15,622	\$0	\$33,794
SALES TAX	0.00%	\$0				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$13,456	\$4,716	\$15,622	\$0	\$33,794
CONTINGENCY	20.00%					\$6,759
BOND	0.00%					\$0
PROFIT	10.00%					\$3,379
JOB TOTAL						\$43,932

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Estimate:      BLDG  4242      Date:      23-Nov-94
Description:    INSTALL INFARED HEATING SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG, N.C. Job #:      94013.04
Sq. footage:   6000.00      City indx:Raleigh, NC
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SUMMARY

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              Manhours   Matl      Labor   Equipment   Sub      Total
=====
U02 SITEWORK      168      $742      $3,331      $781      $0      $4,854
U15 MECHANICAL    85      $12,714    $1,385      $14,841    $0      $28,940
TOTAL             253      $13,456    $4,716      $15,622    $0      $33,794

SALES TAX         0.00%      $0
MATL MARKUP       0.00%      $0
LABOR MARKUP      0.00%      $0
EQUIPT MARKUP     0.00%      $0
SUB MARKUP        0.00%      $0

TOTAL BEFORE CONTINGENC $13,456    $4,716    $15,622    $0      $33,794
CONTINGENCY       20.00%      $6,759
BOND              0.00%      $0
PROFIT            10.00%      $3,379
JOB TOTAL                                     $43,932

```

LIFE CYCLE COST ANALYSIS SUMMARY

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) STUDY: 7937EO2A
 INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3
 PROJECT NO. & TITLE: 94013.04 LES: ECO2 - NAT GAS INFRARED HEAT
 FISCAL YEAR 95 DISCRETE PORTION NAME: ECO
 ANALYSIS DATE: 12-12-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	174610.		
B. SIOH	\$	8731.		
C. DESIGN COST	\$	8731.		
D. TOTAL COST (1A+1B+1C)	\$	192072.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$		0.	
F. PUBLIC UTILITY COMPANY REBATE	\$		0.	
G. TOTAL INVESTMENT (1D - 1E - 1F)				\$ 192072.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	30.	\$ 1062.	15.08	\$ 16022.
B. DIST	\$ 19.18	3588.	\$ 68822.	18.57	\$ 1278033.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	-2297.	\$ -30872.	18.58	\$ -573603.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 0.	14.88	\$ 0.
N. TOTAL		1322.	\$ 39013.		\$ 720452.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$ 1954.
(1) DISCOUNT FACTOR (TABLE A)	14.88	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$ 29069.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+) COST(-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-) (3A2+3Bd4) \$ 29069.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ 40966.

5. SIMPLE PAYBACK PERIOD (1G/4) 4.69 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 749520.

7. SAVINGS TO INVESTMENT RATIO (SIR) = (6 / 1G) = 3.90
 (IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 10.26 %

LIFE CYCLE COST ANALYSIS SUMMARY

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) STUDY: 7937EO2B
 INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 LCCID FY95 (92)
 PROJECT NO. & TITLE: 94013.04 LES: ECO2 - NAT GAS INFRARED HEAT CENSUS: 3
 FISCAL YEAR 95 DISCRETE PORTION NAME: ECO
 ANALYSIS DATE: 12-12-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	205745.		
B. SIOH	\$	10287.		
C. DESIGN COST	\$	10287.		
D. TOTAL COST (1A+1B+1C)	\$	226319.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.		
F. PUBLIC UTILITY COMPANY REBATE	\$	0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)			\$	226319.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	30.	\$ 1062.	15.08	\$ 16022.
B. DIST	\$ 19.18	3588.	\$ 68822.	18.57	\$ 1278033.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	-2297.	\$ -30872.	18.58	\$ -573603.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 0.	14.88	\$ 0.
N. TOTAL		1322.	\$ 39013.		\$ 720452.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$	1954.
(1) DISCOUNT FACTOR (TABLE A)		14.88	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$	29069.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+) COST(-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-) (3A2+3Bd4) \$ 29069.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ 40966.

5. SIMPLE PAYBACK PERIOD (1G/4) 5.52 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 749520.

7. SAVINGS TO INVESTMENT RATIO (SIR) = $(6 / 1G) =$ 3.31
 (IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 9.36 %

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Estimate:      BLDG 7937          Date:      23-Nov-94
Description:    INSTALL INFARED HEATING SYSTEM COST ESTIMATE
Project:        LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG, N.C.  Job #:      94013.04
Sq. footage:    *****          City indx:Raleigh, NC
=====

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Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0205541750	PAVEMENT REMOVAL, BITUMINOUS, 4" TO 6" THICK						
						40.00 S.Y.	
Unit values		0.10	0.00	1.73	2.50	0.00	4.23
Totals		3.80	\$0	\$69	\$100	\$0	\$169
0205543200	SITE REMOVAL, STEEL PIPE, WELDED CONNECTION, UP TO 4" DIAMETER						
						3000.00 L.F.	
Unit values		0.15	0.00	2.61	1.06	0.00	3.68
Totals		450.00	\$0	\$7,838	\$3,191	\$0	\$11,029
0207183600	HVAC DEMO, MECH EQPT HEAVY ITEM						
						3.00 Ton	
Unit values		14.55	0.00	314.87	0.00	0.00	314.87
Totals		43.64	\$0	\$945	\$0	\$0	\$945
0208400600	REMOVE PIPE INSULATION UP TO 4" DIAMETER PIPE						
						3000.00 L.F.	
Unit values		0.07	0.00	1.63	0.20	0.00	1.83
Totals		213.00	\$0	\$4,902	\$587	\$0	\$5,489
0208401000	REMOVE INSULATION FROM PIPE FITTING, UP TO 4" DIAMETER PIPE						
						400.00 Ea.	
Unit values		0.20	0.00	4.60	0.56	0.00	5.16
Totals		80.00	\$0	\$1,838	\$225	\$0	\$2,063
0222541900	TAMPING TRENCH B'FILL, VIBRATING PLATE, ADD						
						25.00 C.Y.	
Unit values		0.09	0.00	1.44	0.55	0.00	1.99
Totals		2.23	\$0	\$36	\$14	\$0	\$50
0222582800	TRENCH EXCVTNG 40HP CHNTRNCHR&BKFL 12"W24"D						
						300.00 L.F.	
Unit values		0.01	0.00	0.20	0.20	0.00	0.39
Totals		3.00	\$0	\$59	\$59	\$0	\$118
0251040380	ASPHALTIC CONCRETE PAVEMENT, PAVING, WEARING COURSE, 2" THICK						
						40.00 S.Y.	
Unit values		0.02	2.96	0.27	0.25	0.00	3.48
Totals		0.60	\$118	\$11	\$10	\$0	\$139

0260120200	BEDDING, FOR PIPE IN TRENCH SAND, DEAD OR BANK					5.00 C.Y.	
Unit values	0.16	3.79	2.79	1.13	0.00	7.71	
Totals	0.80	\$19	\$14	\$6	\$0	\$39	
0260120500	BEDDING, PLACING IN TRENCH					5.00 C.Y.	
Unit values	0.09	0.00	1.44	0.55	0.00	1.99	
Totals	0.45	\$0	\$7	\$3	\$0	\$10	
0266907800	CUT IN VALVES, W/DUCK TIP GASKET, 4" DIAMETER					1.00 Ea.	
Unit values	1.56	404.00	29.36	4.89	0.00	438.25	
Totals	1.56	\$404	\$29	\$5	\$0	\$438	
0268520150	GAS SERVICE & DISTRIB PIPING, POLYETHYLENE, 60-PSI 1-1/4" DIAM SDR 10, COIL					310.00 L.F.	
Unit values	0.06	0.63	1.10	0.00	0.00	1.72	
Totals	18.60	\$194	\$340	\$0	\$0	\$534	
0268520600	GAS SERVICE&DISTRIB PIPING, SCH40 STEEL PLAIN END, TAR COAT&WRAP 1-1/4" DIAM					50.00 L.F.	
Unit values	0.11	3.40	2.63	0.15	0.00	6.19	
Totals	5.70	\$170	\$131	\$8	\$0	\$309	

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Line #      Description
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              Manhours   Matl      Labor    Equipment   Sub      Total
=====
U02 SITEWORK      824      $905    $16,219    $4,208      $0    $21,332

1531106180      WTR HTR CML 100<R GAS 200 MBH 192 GPH
REUSE EXISTING VENT
Unit values      13.33    2097.90    226.88      0.00      0.00    2324.78
Totals           13.33    $2,098      $227        $0        $0    $2,325

1551153320      HTG BR GAS CI STD HTWR GOP 2000 MBH
Unit values      84.21   12487.50   1376.38      0.00      0.00   13863.88
Totals           84.21   $12,488    $1,376        $0        $0   $13,864

1554510245      HTG CO-RAY-VAC INFA-RD UNT GAS ELEC IGN
(See Attached Estimate for details)
Unit values      0.00      0.00      0.00  96559.00      0.00  96559.00
Totals           0.00      $0        $0    $96,559      $0    $96,559

1562600137      GAS APPLIANCE REGULATORS DOUBLE DIAPHRAGM
TYPE 1-1/4" PIPE SIZE
Unit values      0.53    225.77      9.14      0.00      0.00    234.91
Totals           0.53    $226        $9        $0        $0    $235

U15 MECHANICAL      99    $14,812    $1,612    $96,559      $0    $112,983

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=====
Line #      Description
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      Manhours  Matl    Labor  Equipment  Sub    Total
=====
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ESTIMATE TOTAL	923	\$15,717	\$17,831	\$100,767	\$0	\$134,315
SALES TAX	0.00%	\$0				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$15,717	\$17,831	\$100,767	\$0	\$134,315
CONTINGENCY	20.00%					\$26,863
BOND	0.00%					\$0
PROFIT	10.00%					\$13,432
JOB TOTAL						\$174,610

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=====
Estimate:      BLDG 7937          Date:      23-Nov-94
Description:   INSTALL INFARED HEATING SYSTEM COST ESTIMATE
Project:      LIMITED EEAP(HGR) Bid Date:
Location:     FORT BRAGG, N.C.  Job #:      94013.04
Sq. footage:  *****          City indx:Raleigh, NC
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SUMMARY

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	Manhours	Matl	Labor	Equipment	Sub	Total
U02 SITEWORK	824	\$905	\$16,219	\$4,208	\$0	\$21,332
U15 MECHANICAL	99	\$14,812	\$1,612	\$96,559	\$0	\$112,983
TOTAL	923	\$15,717	\$17,831	\$100,767	\$0	\$134,315
SALES TAX	0.00%	\$0				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$15,717	\$17,831	\$100,767	\$0	\$134,315
CONTINGENCY	20.00%					\$26,863
BOND	0.00%					\$0
PROFIT	10.00%					\$13,432
JOB TOTAL						\$174,610

LIFE CYCLE COST ANALYSIS SUMMARY

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) STUDY: 8944EO2A
 INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 LCCID FY95 (92)
 PROJECT NO. & TITLE: 94013.04 LES: ECO2 - NAT GAS INFRARED HEAT
 FISCAL YEAR 95 DISCRETE PORTION NAME: ECO
 ANALYSIS DATE: 12-12-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	173113.		
B. SIOH	\$	8656.		
C. DESIGN COST	\$	8656.		
D. TOTAL COST (1A+1B+1C)	\$	190425.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$		0.	
F. PUBLIC UTILITY COMPANY REBATE	\$		0.	
G. TOTAL INVESTMENT (1D - 1E - 1F)				\$ 190425.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	52.	\$ 1816.	15.08	\$ 27385.
B. DIST	\$ 19.18	3148.	\$ 60370.	18.57	\$ 1121078.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	-1623.	\$ -21808.	18.58	\$ -405185.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 0.	14.88	\$ 0.
N. TOTAL		1577.	\$ 40379.		\$ 743278.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$ 6254.
(1) DISCOUNT FACTOR (TABLE A)	14.88	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$ 93063.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-) (3A2+3Bd4) \$ 93063.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ 46633.

5. SIMPLE PAYBACK PERIOD (1G/4) 4.08 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 836341.

7. SAVINGS TO INVESTMENT RATIO (SIR) = $(6 / 1G) =$ 4.39
 (IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 10.91 %

LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 8944EO2B

LCCID FY95 (92)

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 94013.04 LES: ECO2 - NAT GAS INFRARED HEAT

FISCAL YEAR 95 DISCRETE PORTION NAME: ECO

ANALYSIS DATE: 12-12-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	204248.	
B. SIOH	\$	10212.	
C. DESIGN COST	\$	10212.	
D. TOTAL COST (1A+1B+1C)	\$	224672.	
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.	
F. PUBLIC UTILITY COMPANY REBATE	\$	0.	
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$		224672.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	52.	\$ 1816.	15.08	\$ 27385.
B. DIST	\$ 19.18	3148.	\$ 60370.	18.57	\$ 1121078.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	-1623.	\$ -21808.	18.58	\$ -405185.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 0.	14.88	\$ 0.
N. TOTAL		1577.	\$ 40379.		\$ 743278.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)

(1) DISCOUNT FACTOR (TABLE A)	14.88	\$ 6254.
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$ 93063.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+) COST(-) (4)
------	------------------------------	-----------------	------------------------	---

d. TOTAL \$ 0. 0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-) (3A2+3Bd4) \$ 93063.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS\ ECONOMIC\ LIFE))$ \$ 46633.

5. SIMPLE PAYBACK PERIOD (1G/4) 4.82 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 836341.

7. SAVINGS TO INVESTMENT RATIO (SIR) = $(6 / 1G) =$ 3.72
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 10.00 %


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=====
Estimate:      BLDG 8944          Date:      23-Nov-94
Description:    INSTALL INFARED HEATING SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG, N.C.  Job #:      94013.04
Sq. footage:   *****          City indx:Raleigh, NC
=====

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Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0205541750	PAVEMENT REMOVAL, BITUMINOUS, 4" TO 6" THICK					40.00 S.Y.	
Unit values		0.10	0.00	1.73	2.50	0.00	4.23
Totals		3.80	\$0	\$69	\$100	\$0	\$169
0205543200	SITE REMOVAL, STEEL PIPE, WELDED CONNECTION, UP TO 4" DIAMETER					3000.00 L.F.	
Unit values		0.15	0.00	2.61	1.06	0.00	3.68
Totals		450.00	\$0	\$7,838	\$3,191	\$0	\$11,029
0207183600	HVAC DEMO, MECH EQPT HEAVY ITEM					3.00 Ton	
Unit values		14.55	0.00	314.87	0.00	0.00	314.87
Totals		43.64	\$0	\$945	\$0	\$0	\$945
0208400600	REMOVE PIPE INSULATION UP TO 4" DIAMETER PIPE					3000.00 L.F.	
Unit values		0.07	0.00	1.63	0.20	0.00	1.83
Totals		213.00	\$0	\$4,902	\$587	\$0	\$5,489
0208401000	REMOVE INSULATION FROM PIPE FITTING, UP TO 4" DIAMETER PIPE					400.00 Ea.	
Unit values		0.20	0.00	4.60	0.56	0.00	5.16
Totals		80.00	\$0	\$1,838	\$225	\$0	\$2,063
0222541900	TAMPING TRENCH B'FILL, VIBRATING PLATE, ADD					25.00 C.Y.	
Unit values		0.09	0.00	1.44	0.55	0.00	1.99
Totals		2.23	\$0	\$36	\$14	\$0	\$50
0222582800	TRENCH EXCVTNG 40HP CHNTRNCHR&BKFL 12"W24"D					300.00 L.F.	
Unit values		0.01	0.00	0.20	0.20	0.00	0.39
Totals		3.00	\$0	\$59	\$59	\$0	\$118
0251040380	ASPHALTIC CONCRETE PAVEMENT, PAVING, WEARING COURSE, 2" THICK					40.00 S.Y.	
Unit values		0.02	2.96	0.27	0.25	0.00	3.48
Totals		0.60	\$118	\$11	\$10	\$0	\$139

0260120200	BEDDING, FOR PIPE IN TRENCH SAND, DEAD OR BANK					5.00 C.Y.	
Unit values	0.16	3.79	2.79	1.13	0.00	7.71	
Totals	0.80	\$19	\$14	\$6	\$0	\$39	
0260120500	BEDDING, PLACING IN TRENCH					5.00 C.Y.	
Unit values	0.09	0.00	1.44	0.55	0.00	1.99	
Totals	0.45	\$0	\$7	\$3	\$0	\$10	
0266907800	CUT IN VALVES, W/DUCK TIP GASKET, 4" DIAMETER					1.00 Ea.	
Unit values	1.56	404.00	29.36	4.89	0.00	438.25	
Totals	1.56	\$404	\$29	\$5	\$0	\$438	
0268520150	GAS SERVICE & DISTRIB PIPING, POLYETHYLENE, 60-PSI 1-1/4" DIAM SDR 10, COIL					310.00 L.F.	
Unit values	0.06	0.63	1.10	0.00	0.00	1.72	
Totals	18.60	\$194	\$340	\$0	\$0	\$534	
0268520600	GAS SERVICE&DISTRIB PIPING, SCH40 STEEL PLAIN END, TAR COAT&WRAP 1-1/4" DIAM					50.00 L.F.	
Unit values	0.11	3.40	2.63	0.15	0.00	6.19	
Totals	5.70	\$170	\$131	\$8	\$0	\$309	

=====						
Line #	Description					

	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
U02 SITEWORK	824	\$905	\$16,219	\$4,208	\$0	\$21,332
1531106180	WTR HTR CML 100<R GAS 200 MBH 192 GPH REUSE EXISTING VENT				1.00 Ea.	
Unit values	13.33	2097.90	226.88	0.00	0.00	2324.78
Totals	13.33	\$2,098	\$227	\$0	\$0	\$2,325
1551153320	HTG BR GAS CI STD HTWR GOP 2000 MBH				1.00 Ea.	
Unit values	84.21	12487.50	1376.38	0.00	0.00	13863.88
Totals	84.21	\$12,488	\$1,376	\$0	\$0	\$13,864
1554510245	HTG CO-RAY-VAC INFA-RD UNT GAS ELEC IGN (See Attached Estimate for details)				1.00 LS	
Unit values	0.00	0.00	0.00	95408.00	0.00	95408.00
Totals	0.00	\$0	\$0	\$95,408	\$0	\$95,408
1562600137	GAS APPLIANCE REGULATORS DOUBLE DIAPHRAGM TYPE 1-1/4" PIPE SIZE				1.00 Ea.	
Unit values	0.53	225.77	9.14	0.00	0.00	234.91
Totals	0.53	\$226	\$9	\$0	\$0	\$235
U15 MECHANICAL	99	\$14,812	\$1,612	\$95,408	\$0	\$111,832

```
=====
Line #      Description
-----
      Manhours   Matl    Labor   Equipment   Sub    Total
=====
```

ESTIMATE TOTAL	923	\$15,717	\$17,831	\$99,616	\$0	\$133,164
SALES TAX	0.00%	\$0				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$15,717	\$17,831	\$99,616	\$0	\$133,164
CONTINGENCY	20.00%					\$26,633
BOND	0.00%					\$0
PROFIT	10.00%					\$13,316
JOB TOTAL						\$173,113

```

=====
Estimate:      BLDG  8944      Date:      23-Nov-94
Description:   INSTALL INFARED HEATING SYSTEM COST ESTIMATE
Project:      LIMITED EEAP(HGR) Bid Date:
Location:     FORT BRAGG, N.C. Job #:      94013.04
Sq. footage:  *****      City indx:Raleigh, NC
=====

```

SUMMARY

```

-----
Manhours  Matl  Labor  Equipment  Sub  Total
=====
U02 SITEWORK      824      $905  $16,219    $4,208      $0  $21,332
U15 MECHANICAL    99      $14,812  $1,612    $95,408      $0  $111,832
TOTAL             923      $15,717  $17,831    $99,616      $0  $133,164

SALES TAX         0.00%      $0
MATL MARKUP       0.00%      $0
LABOR MARKUP      0.00%      $0
EQUIPT MARKUP     0.00%      $0
SUB MARKUP        0.00%      $0

TOTAL BEFORE CONTINGENC  $15,717  $17,831  $99,616      $0  $133,164
CONTINGENCY        20.00%      $26,633
BOND               0.00%      $0
PROFIT            10.00%      $13,316
JOB TOTAL                                     $173,113

```

LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 9647EO2A

LCCID FY95 (92)

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 94013.04 LES: ECO2 - NAT GAS INFRARED HEAT

FISCAL YEAR 95 DISCRETE PORTION NAME: ECO

ANALYSIS DATE: 12-12-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	155198.	
B. SIOH	\$	7760.	
C. DESIGN COST	\$	7760.	
D. TOTAL COST (1A+1B+1C)	\$	170718.	
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.	
F. PUBLIC UTILITY COMPANY REBATE	\$	0.	
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$		170718.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH (1)	SAVINGS MWH/YR (2)	ANNUAL \$ SAVINGS (3)	DISCOUNT FACTOR (4)	DISCOUNTED SAVINGS (5)
A. ELECT	\$ 34.95	19.	\$ 659.	15.08	\$ 9935.
B. DIST	\$ 19.18	2411.	\$ 46238.	18.57	\$ 858647.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	-1444.	\$ -19403.	18.58	\$ -360506.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 0.	14.88	\$ 0.
N. TOTAL		986.	\$ 27494.		\$ 508075.

3. NON ENERGY SAVINGS (+) / COST (-)

A. ANNUAL RECURRING (+/-)

(1) DISCOUNT FACTOR (TABLE A) 14.88

(2) DISCOUNTED SAVING/COST (3A X 3A1) \$ 15351.

B. NON RECURRING SAVINGS (+) / COSTS (-)

ITEM	SAVINGS (+) COST (-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS (+) / COST (-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS (+) / COST (-) (3A2+3Bd4) \$ 15351.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ 28526.

5. SIMPLE PAYBACK PERIOD (1G/4) 5.98 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 523426.

7. SAVINGS TO INVESTMENT RATIO (SIR) = (6 / 1G) = 3.07
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 8.93 %

LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 9647EO2B

LCCID FY95 (92)

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 94013.04 LES: ECO2 - NAT GAS INFRARED HEAT

FISCAL YEAR 95 DISCRETE PORTION NAME: ECO

ANALYSIS DATE: 12-12-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	186333.		
B. SIOH	\$	9317.		
C. DESIGN COST	\$	9317.		
D. TOTAL COST (1A+1B+1C)	\$	204967.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.		
F. PUBLIC UTILITY COMPANY REBATE	\$	0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$		204967.	

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH (1)	SAVINGS MWH/YR (2)	ANNUAL \$ SAVINGS (3)	DISCOUNT FACTOR (4)	DISCOUNTED SAVINGS (5)
A. ELECT	\$ 34.95	19.	\$ 659.	15.08	\$ 9935.
B. DIST	\$ 19.18	2411.	\$ 46238.	18.57	\$ 858647.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	-1444.	\$ -19403.	18.58	\$ -360506.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 0.	14.88	\$ 0.
N. TOTAL		986.	\$ 27494.		\$ 508075.

3. NON ENERGY SAVINGS (+) / COST (-)

A. ANNUAL RECURRING (+/-)		\$	1032.
(1) DISCOUNT FACTOR (TABLE A)	14.88		
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$	15351.

B. NON RECURRING SAVINGS (+) / COSTS (-)

ITEM	SAVINGS (+) COST (-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS (+) / COST (-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS (+) / COST (-) (3A2+3Bd4) \$ 15351.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS\ ECONOMIC\ LIFE))$ \$ 28526.

5. SIMPLE PAYBACK PERIOD (1G/4) 7.19 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 523426.

7. SAVINGS TO INVESTMENT RATIO (SIR) = (6 / 1G) = 2.55
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 7.94 %

```

=====
Estimate:      BLDG  9647          Date:      23-Nov-94
Description:    INSTALL INFARED HEATING SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG, N.C.  Job #:      94013.04
Sq. footage:   *****          City indx:Raleigh, NC
=====

```

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0205541750	PAVEMENT REMOVAL, BITUMINOUS, 4" TO 6" THICK					40.00 S.Y.	
Unit values		0.10	0.00	1.73	2.50	0.00	4.23
Totals		3.80	\$0	\$69	\$100	\$0	\$169
0205543200	SITE REMOVAL, STEEL PIPE, WELDED CONNECTION, UP TO 4" DIAMETER					3000.00 L.F.	
Unit values		0.15	0.00	2.61	1.06	0.00	3.68
Totals		450.00	\$0	\$7,838	\$3,191	\$0	\$11,029
0207183600	HVAC DEMO, MECH EQPT HEAVY ITEM					3.00 Ton	
Unit values		14.55	0.00	314.87	0.00	0.00	314.87
Totals		43.64	\$0	\$945	\$0	\$0	\$945
0208400600	REMOVE PIPE INSULATION UP TO 4" DIAMETER PIPE					3000.00 L.F.	
Unit values		0.07	0.00	1.63	0.20	0.00	1.83
Totals		213.00	\$0	\$4,902	\$587	\$0	\$5,489
0208401000	REMOVE INSULATION FROM PIPE FITTING, UP TO 4" DIAMETER PIPE					400.00 Ea.	
Unit values		0.20	0.00	4.60	0.56	0.00	5.16
Totals		80.00	\$0	\$1,838	\$225	\$0	\$2,063
0222541900	TAMPING TRENCH B'FILL, VIBRATING PLATE, ADD					25.00 C.Y.	
Unit values		0.09	0.00	1.44	0.55	0.00	1.99
Totals		2.23	\$0	\$36	\$14	\$0	\$50
0222582800	TRENCH EXCVTNG 40HP CHNTRNCHR&BKFL 12"W24"D					300.00 L.F.	
Unit values		0.01	0.00	0.20	0.20	0.00	0.39
Totals		3.00	\$0	\$59	\$59	\$0	\$118
0251040380	ASPHALTIC CONCRETE PAVEMENT, PAVING, WEARING COURSE, 2" THICK					40.00 S.Y.	
Unit values		0.02	2.96	0.27	0.25	0.00	3.48
Totals		0.60	\$118	\$11	\$10	\$0	\$139

0260120200	BEDDING, FOR PIPE IN TRENCH SAND, DEAD OR BANK						5.00 C.Y.	
Unit values	0.16	3.79	2.79	1.13	0.00		7.71	
Totals	0.80	\$19	\$14	\$6	\$0		\$39	
0260120500	BEDDING, PLACING IN TRENCH						5.00 C.Y.	
Unit values	0.09	0.00	1.44	0.55	0.00		1.99	
Totals	0.45	\$0	\$7	\$3	\$0		\$10	
0266907800	CUT IN VALVES, W/DUCK TIP GASKET, 4" DIAMETER						1.00 Ea.	
Unit values	1.56	404.00	29.36	4.89	0.00		438.25	
Totals	1.56	\$404	\$29	\$5	\$0		\$438	
0268520150	GAS SERVICE & DISTRIB PIPING, POLYETHYLENE, 60-PSI 1-1/4" DIAM SDR 10, COIL						310.00 L.F.	
Unit values	0.06	0.63	1.10	0.00	0.00		1.72	
Totals	18.60	\$194	\$340	\$0	\$0		\$534	
0268520600	GAS SERVICE&DISTRIB PIPING, SCH40 STEEL PLAIN END, TAR COAT&WRAP 1-1/4" DIAM						50.00 L.F.	
Unit values	0.11	3.40	2.63	0.15	0.00		6.19	
Totals	5.70	\$170	\$131	\$8	\$0		\$309	

```

=====
Line #      Description
-----
              Manhours  Matl    Labor  Equipment  Sub    Total
=====
U02 SITEWORK      824      $905   $16,219   $4,208      $0   $21,332

1531106180      WTR HTR CML 100<R GAS 200 MBH 192 GPH
REUSE EXISTING VENT                                1.00 Ea.
Unit values      13.33   2097.90   226.88      0.00   0.00   2324.78
Totals           13.33   $2,098     $227      $0      $0   $2,325

1551153320      HTG BR GAS CI STD HTWR GOP 2000 MBH
Unit values      84.21  12487.50  1376.38      0.00   0.00   13863.88
Totals           84.21   $12,488   $1,376      $0      $0   $13,864

1554510245      HTG CO-RAY-VAC INFA-RD UNT GAS ELEC IGN
(See Attached Estimate for details)                1.00 LS
Unit values      0.00      0.00      0.00  81627.00   0.00   81627.00
Totals           0.00      $0        $0   $81,627     $0   $81,627

1562600137      GAS APPLIANCE REGULATORS DOUBLE DIAPHRAGM
TYPE 1-1/4" PIPE SIZE                              1.00 Ea.
Unit values      0.53   225.77      9.14      0.00   0.00   234.91
Totals           0.53   $226      $9        $0      $0   $235

U15 MECHANICAL    99      $14,812   $1,612   $81,627      $0   $98,051

```

```
=====
Line #      Description
-----
      Manhours   Matl    Labor   Equipment   Sub    Total
=====

ESTIMATE TOTAL      923    $15,717    $17,831    $85,835          $0    $119,383

SALES TAX            0.00%          $0
MATL MARKUP          0.00%          $0
LABOR MARKUP         0.00%          $0
EQUIPT MARKUP        0.00%          $0
SUB MARKUP           0.00%          $0

TOTAL BEFORE CONTINGENC $15,717    $17,831    $85,835          $0    $119,383
CONTINGENCY           20.00%          $23,877
BOND                  0.00%          $0
PROFIT                10.00%          $11,938

JOB TOTAL                                $155,198
```

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=====
Estimate:      BLDG  9647      Date:      23-Nov-94
Description:    INSTALL INFARED HEATING SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG, N.C.  Job #:      94013.04
Sq. footage:   *****      City indx:Raleigh, NC
=====

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SUMMARY

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-----
              Manhours   Matl      Labor    Equipment    Sub      Total
=====
U02 SITEWORK      824      $905    $16,219    $4,208      $0    $21,332
U15 MECHANICAL    99      $14,812  $1,612    $81,627     $0    $98,051
TOTAL             923      $15,717  $17,831    $85,835     $0    $119,383

SALES TAX         0.00%      $0
MATL MARKUP       0.00%      $0
LABOR MARKUP      0.00%      $0
EQUIPT MARKUP     0.00%      $0
SUB MARKUP        0.00%      $0

TOTAL BEFORE CONTINGENC  $15,717  $17,831  $85,835     $0    $119,383
CONTINGENCY        20.00%      $23,877
BOND               0.00%      $0
PROFIT            10.00%      $11,938

JOB TOTAL                                     $155,198

```

9 ECO - 3 Life Cycle Cost Analyses

LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD, FT. BRAGG, NC

This section contains the life-cycle cost analyses and construction cost estimates for ECO-3: Install Electric Infrared Heaters. The analyses and estimates are sorted by building number.

LCCA ECO-3 - ALL BUILDINGS 9-2

LCCA AND COST ESTIMATE: (sorted by building)

2936	9-3
3007	9-11
3262	9-19
3354	9-27
3637	9-35
3642	9-43
3807	9-51
3954	9-59
3962	9-67
4137	9-75
4242	9-83
7937	9-91
8944	9-99
9647	9-107

LCCA ECO-3

All Buildings

LIFE CYCLE COST ANALYSIS SUMMARY
 ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)
 INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3
 PROJECT NO. & TITLE: 94013.04 LES: ECO3 - TOTAL ALL BUILDINGS
 FISCAL YEAR 95 DISCRETE PORTION NAME: ECO
 ANALYSIS DATE: 12-13-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

STUDY: ECO3TOTL
 LCCID: FY95 (92)

1. INVESTMENT

A. CONSTRUCTION COST	\$	2163885.	
B. SIOH	\$	108194.	
C. DESIGN COST	\$	108194.	
D. TOTAL COST (1A+1B+1C)	\$	2380274.	
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.	
F. PUBLIC UTILITY COMPANY REBATE	\$	0.	
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$	2380274.	

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH (1)	SAVINGS MWH/YR (2)	ANNUAL \$ SAVINGS (3)	DISCOUNT FACTOR (4)	DISCOUNTED SAVINGS (5)
A. ELECT	\$ 34.95	-3940.	\$ -137705.	15.08	\$ -2076593.
B. DIST	\$ 19.18	21205.	\$ 406711.	18.57	\$ 7552622.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	0.	\$ 0.	18.58	\$ 0.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ -501858.	14.88	\$ -7467647.
N. TOTAL		17265.	\$ -232852.		\$ -1991618.

3. NON ENERGY SAVINGS (+) / COST (-)

A. ANNUAL RECURRING (+/-)		\$ 35561.
(1) DISCOUNT FACTOR (TABLE A)	14.88	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$ 529148.

B. NON RECURRING SAVINGS (+) / COSTS (-)

ITEM	SAVINGS (+) COST (-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS (+) / COST (-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS (+) / COST (-) (3A2+3Bd4) \$ 529148.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ -197291.

5. SIMPLE PAYBACK PERIOD (1G/4) -12.06 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ -1462471.

7. SAVINGS TO INVESTMENT RATIO (SIR) = (6 / 1G) = -.61
 (IF < 1 PROJECT DOES NOT QUALIFY)

**** Project does not qualify for ECIP funding; 4,5,6 for information only.

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): N/A

LCCA & COST ESTIMATES

(sorted by building)

LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 2936ECO3

LCCID FY95 (92)

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 94013.04 LES: ECO3 - ELECTRIC INFRARED HEAT

FISCAL YEAR 95 DISCRETE PORTION NAME: ECO

ANALYSIS DATE: 12-05-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	223114.	
B. SIOH	\$	11156.	
C. DESIGN COST	\$	11156.	
D. TOTAL COST (1A+1B+1C)	\$	245426.	
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.	
F. PUBLIC UTILITY COMPANY REBATE	\$	0.	
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$		245426.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH (1)	SAVINGS MWH/YR (2)	ANNUAL \$ SAVINGS (3)	DISCOUNT FACTOR (4)	DISCOUNTED SAVINGS (5)
A. ELECT	\$ 34.95	-485.	\$ -16936.	15.08	\$ -255391.
B. DIST	\$ 19.18	2024.	\$ 38819.	18.57	\$ 720861.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	0.	\$ 0.	18.58	\$ 0.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ -53835.	14.88	\$ -801065.
N. TOTAL		1539.	\$ -31952.		\$ -335594.

3. NON ENERGY SAVINGS (+) / COST (-)

A. ANNUAL RECURRING (+/-)		\$	2574.
(1) DISCOUNT FACTOR (TABLE A)	14.88		
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$	38295.

B. NON RECURRING SAVINGS (+) / COSTS (-)

ITEM	SAVINGS (+) COST (-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS (+) / COST (-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS (+) / COST (-) (3A2+3Bd4) \$ 38295.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ -29379.

5. SIMPLE PAYBACK PERIOD (1G/4) -8.35 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ -297300.

7. SAVINGS TO INVESTMENT RATIO (SIR) = (6 / 1G) = -1.21
(IF < 1 PROJECT DOES NOT QUALIFY)

**** Project does not qualify for ECIP funding; 4,5,6 for information only.

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): N/A

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=====
Estimate:      BLDG 2936          Date:      28-Nov-94
Description:    ELECTRIC INFRARED HEATING SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG,N.C   Job #:      94013.04
Sq. footage:   28800           City indx:Raleigh, NC
=====

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Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0913100280	FEEDER INSTALLATION, INCLUDING CONDUIT AND WIRE, 200 AMPERES					4000.00 L.F.	
Unit values		0.31	9.45	6.71	0.00	0.00	16.16
Totals		1224.00	\$37,781	\$26,846	\$0	\$0	\$64,627
0914100360	SWITCHGEAR INST, INCL SWBD, PANELS & CIRC BKR, 1600 AMPERES					1.00 EACH	
Unit values		208.17	13519.60	4568.40	0.00	0.00	18088.00
Totals		208.17	\$13,520	\$4,568	\$0	\$0	\$18,088
A09 ELECTRICAL		1433	\$51,301	\$31,414	\$0	\$0	\$82,715

=====						
Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
0205541750	PAVEMENT REMOVAL, BITUMINOUS, 4" TO 6" THICK					
					40.00 S.Y.	
Unit values	0.10	0.00	1.73	2.50	0.00	4.23
Totals	3.80	\$0	\$69	\$100	\$0	\$169
0205543200	SITE REMOVAL, STEEL PIPE, WELDED CONNECTION, 4" DIAMETER					
					4000.00 L.F.	
Unit values	0.15	0.00	2.61	1.06	0.00	3.68
Totals	600.00	\$0	\$10,450	\$4,255	\$0	\$14,705
0207183600	HVAC DEMO, MECH EQPT HEAVY ITEM					
					2.00 Ton	
Unit values	14.55	0.00	314.87	0.00	0.00	314.87
Totals	29.09	\$0	\$630	\$0	\$0	\$630
0208400600	REMOVE PIPE INSULATION UP TO 4" DIAMETER PIPE					
					4000.00 L.F.	
Unit values	0.07	0.00	1.63	0.20	0.00	1.83
Totals	284.00	\$0	\$6,536	\$783	\$0	\$7,319
0208401000	REMOVE INSULATION FROM PIPE FITTING, UP TO 4" DIAMETER PIPE					
					500.00 Ea.	
Unit values	0.20	0.00	4.60	0.56	0.00	5.16
Totals	100.00	\$0	\$2,298	\$281	\$0	\$2,579
0222540060	EXCAV TRENCH, COMMON EARTH, 1'-4' DEEP, 1/2 CY TRAC/LDR/B'HOE					
					25.00 C.Y.	
Unit values	0.08	0.00	1.47	1.17	0.00	2.64
Totals	2.00	\$0	\$37	\$29	\$0	\$66
0222541900	TAMPING TRENCH B'FILL, VIBRATING PLATE, ADD					
					25.00 C.Y.	
Unit values	0.09	0.00	1.44	0.55	0.00	1.99
Totals	2.23	\$0	\$36	\$14	\$0	\$50
0222543020	BACKFILL TRENCH, F.E. LOADER, WHEEL MTD., 1CY BUCKET, MIN HAUL					
					25.00 C.Y.	
Unit values	0.03	0.00	0.58	0.48	0.00	1.06
Totals	0.75	\$0	\$14	\$12	\$0	\$26
0251040380	ASPHALTIC CONCRETE PAVEMENT, PAVING, WEARING COURSE, 2" THICK					
					40.00 S.Y.	
Unit values	0.02	2.96	0.27	0.25	0.00	3.48
Totals	0.60	\$118	\$11	\$10	\$0	\$139

```
=====
Line #      Description
-----
              Manhours   Matl      Labor    Equipment   Sub      Total
=====
U02 SITEWORK      1023      $118    $20,081    $5,484        $0    $25,683
0331305010      6" THICK SLAB FOR NEW TRANSFORMER
Unit values      0.02      1.45      0.28      0.00      48.00 S.F.  1.73
Totals           1.15      $70      $13       $0       0.00      $83
U03 CONCRETE       2      $70      $13       $0        $0      $83
=====
```

=====						
Line #	Description					

	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1554512050	HTG INFRA RED ELEC 6KW 20478BTU					
					14.00 Ea.	
Unit values	2.67	334.67	44.47	0.00	0.00	379.13
Totals	37.34	\$4,685	\$623	\$0	\$0	\$5,308
1554512100	HTG INFRA RED ELEC 13.5KW 46075.5BTU					
					14.00 Ea.	
Unit values	3.20	455.20	53.24	0.00	0.00	508.44
Totals	44.80	\$6,373	\$745	\$0	\$0	\$7,118
1554512150	HTG INFRA RED ELEC 27KW 92151BTU					
					33.00 Ea.	
Unit values	4.00	879.31	66.55	0.00	0.00	945.86
Totals	132.00	\$29,017	\$2,196	\$0	\$0	\$31,213
1574205220	ELECTRIC THERMOSTAT W/ COVER AND WIRING					
					47.00 Ea.	
Unit values	1.00	74.93	20.81	0.00	0.00	95.74
Totals	47.00	\$3,521	\$978	\$0	\$0	\$4,499
U15 MECHANICAL	262	\$43,596	\$4,542	\$0	\$0	\$48,138

=====						
Line #	Description					

	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1611400600	MINERAL INSULATED CABLE 600V 1 #4					
					3.00 C.L.F.	
Unit values	6.67	402.81	103.21	0.00	0.00	506.02
Totals	20.00	\$1,208	\$310	\$0	\$0	\$1,518
1611400800	MINERAL INSULATED CABLE 600V 1 #2					
					6.00 C.L.F.	
Unit values	7.27	537.08	112.80	0.00	0.00	649.88
Totals	43.64	\$3,222	\$677	\$0	\$0	\$3,899
1621100220	OUTLET BOXES STEEL, 4" SQ, 2-1/8" DEEP, 1" K.O.'S					
					47.00 Ea.	
Unit values	0.40	2.36	6.20	0.00	0.00	8.57
Totals	18.80	\$111	\$292	\$0	\$0	\$403
1621100250	OUTLET BOX STEEL 4" COVERS BLANK					
					47.00 Ea.	
Unit values	0.13	0.54	1.94	0.00	0.00	2.48
Totals	5.88	\$25	\$91	\$0	\$0	\$116
1631200100	HEATING SYSTEM POWER / CONTROL PANEL					
					10.00 Ea.	
Unit values	2.96	320.72	45.97	0.00	0.00	366.69
Totals	29.63	\$3,207	\$460	\$0	\$0	\$3,667
1641600500	TRANSFORMER OIL PAD 15KV 480V 3P1000KVA					
					1.00 Ea.	
Unit values	76.92	17408.80	1184.40	225.60	0.00	18818.80
Totals	76.92	\$17,409	\$1,184	\$226	\$0	\$18,819
1671104800	UNDERGROUND DUCT BANK PVC TYPE EB 4 - 2" DIA					
					250.00 L.F.	
Unit values	0.13	1.48	2.07	0.00	0.00	3.55
Totals	33.25	\$370	\$517	\$0	\$0	\$887
U16 ELECTRICAL	229	\$25,552	\$3,531	\$226	\$0	\$29,309

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=====
Line #      Description
-----
              Manhours   Matl      Labor    Equipment   Sub      Total
=====
```

ESTIMATE TOTAL	2949	\$120,637	\$59,581	\$5,710	\$0	\$185,928
SALES TAX	0.00%	\$0				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$120,637	\$59,581	\$5,710	\$0	\$185,928
CONTINGENCY	10.00%					\$18,593
BOND	0.00%					\$0
PROFIT	10.00%					\$18,593
JOB TOTAL						\$223,114

```

=====
Estimate:      BLDG 2936      Date:      28-Nov-94
Description:   ELECTRIC INFRARED HEATING SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG,N.C Job #:      94013.04
Sq. footage:   28800         City indx:Raleigh, NC
=====

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SUMMARY

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-----
Manhours  Matl    Labor  Equipment  Sub    Total
=====
A09 ELECTRICAL  1433  $51,301  $31,414      $0      $0  $82,715
U02 SITEWORK    1023    $118    $20,081    $5,484      $0  $25,683
U03 CONCRETE      2     $70      $13        $0      $0    $83
U15 MECHANICAL   262   $43,596   $4,542      $0      $0  $48,138
U16 ELECTRICAL   229   $25,552   $3,531    $226      $0  $29,309

TOTAL          2949  $120,637  $59,581    $5,710      $0  $185,928

SALES TAX      0.00%      $0
MATL MARKUP    0.00%      $0
LABOR MARKUP   0.00%      $0
EQUIPT MARKUP  0.00%      $0
SUB MARKUP     0.00%      $0

TOTAL BEFORE CONTINGENC  $120,637  $59,581  $5,710      $0  $185,928
CONTINGENCY      10.00%      $18,593
BOND              0.00%      $0
PROFIT           10.00%      $18,593

JOB TOTAL                                     $223,114

```


LIFE CYCLE COST ANALYSIS SUMMARY

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) STUDY: 3007ECO3
 INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 LCCID FY95 (92)
 PROJECT NO. & TITLE: 94013.04 LES: ECO3 - ELECTRIC INFRARED HEAT
 FISCAL YEAR 95 DISCRETE PORTION NAME: ECO
 ANALYSIS DATE: 12-05-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	214760.		
B. SIOH	\$	10738.		
C. DESIGN COST	\$	10738.		
D. TOTAL COST (1A+1B+1C)	\$	236236.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$		0.	
F. PUBLIC UTILITY COMPANY REBATE	\$		0.	
G. TOTAL INVESTMENT (1D - 1E - 1F)				\$ 236236.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	-293.	\$ -10253.	15.08	\$ -154609.
B. DIST	\$ 19.18	1977.	\$ 37918.	18.57	\$ 704143.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	0.	\$ 0.	18.58	\$ 0.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ -47522.	14.88	\$ -707127.
N. TOTAL		1684.	\$ -19856.		\$ -157594.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$ 338.
(1) DISCOUNT FACTOR (TABLE A)	14.88	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$ 5027.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-) (3A2+3Bd4) \$ 5027.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ -19518.

5. SIMPLE PAYBACK PERIOD (1G/4) -12.10 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ -152567.

7. SAVINGS TO INVESTMENT RATIO (SIR) = (6 / 1G) = -.65
 (IF < 1 PROJECT DOES NOT QUALIFY)

**** Project does not qualify for ECIP funding; 4,5,6 for information only.

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): N/A

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=====
Estimate:      BLDG  3007          Date:      28-Nov-94
Description:    ELECTRIC INFRARED HEATING SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG,N.C   Job #:      94013.04
Sq. footage:   31586           City indx:Raleigh, NC
=====

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Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0913100280	FEEDER INSTALLATION, INCLUDING CONDUIT AND WIRE, 200 AMPERES					4000.00 L.F.	
Unit values		0.31	9.45	6.71	0.00	0.00	16.16
Totals		1224.00	\$37,781	\$26,846	\$0	\$0	\$64,627
0914100360	SWITCHGEAR INST, INCL SWBD, PANELS & CIRC BKR, 1600 AMPERES					1.00 EACH	
Unit values		208.17	13519.60	4568.40	0.00	0.00	18088.00
Totals		208.17	\$13,520	\$4,568	\$0	\$0	\$18,088
A09 ELECTRICAL		1433	\$51,301	\$31,414	\$0	\$0	\$82,715

=====						
Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
0205541750	PAVEMENT REMOVAL, BITUMINOUS, 4" TO 6" THICK					
					40.00 S.Y.	
Unit values	0.10	0.00	1.73	2.50	0.00	4.23
Totals	3.80	\$0	\$69	\$100	\$0	\$169
0205543200	SITE REMOVAL, STEEL PIPE, WELDED CONNECTION, 4" DIAMETER					
					4000.00 L.F.	
Unit values	0.15	0.00	2.61	1.06	0.00	3.68
Totals	600.00	\$0	\$10,450	\$4,255	\$0	\$14,705
0207183600	HVAC DEMO, MECH EQPT HEAVY ITEM					
					2.00 Ton	
Unit values	14.55	0.00	314.87	0.00	0.00	314.87
Totals	29.09	\$0	\$630	\$0	\$0	\$630
0208400600	REMOVE PIPE INSULATION UP TO 4" DIAMETER PIPE					
					4000.00 L.F.	
Unit values	0.07	0.00	1.63	0.20	0.00	1.83
Totals	284.00	\$0	\$6,536	\$783	\$0	\$7,319
0208401000	REMOVE INSULATION FROM PIPE FITTING, UP TO 4" DIAMETER PIPE					
					500.00 Ea.	
Unit values	0.20	0.00	4.60	0.56	0.00	5.16
Totals	100.00	\$0	\$2,298	\$281	\$0	\$2,579
0222540060	EXCAV TRENCH, COMMON EARTH, 1'-4' DEEP, 1/2 CY TRAC/LDR/B'HOE					
					25.00 C.Y.	
Unit values	0.08	0.00	1.47	1.17	0.00	2.64
Totals	2.00	\$0	\$37	\$29	\$0	\$66
0222541900	TAMPING TRENCH B'FILL, VIBRATING PLATE, ADD					
					25.00 C.Y.	
Unit values	0.09	0.00	1.44	0.55	0.00	1.99
Totals	2.23	\$0	\$36	\$14	\$0	\$50
0222543020	BACKFILL TRENCH, F.E. LOADER, WHEEL MTD., 1CY BUCKET, MIN HAUL					
					25.00 C.Y.	
Unit values	0.03	0.00	0.58	0.48	0.00	1.06
Totals	0.75	\$0	\$14	\$12	\$0	\$26
0251040380	ASPHALTIC CONCRETE PAVEMENT, PAVING, WEARING COURSE, 2" THICK					
					40.00 S.Y.	
Unit values	0.02	2.96	0.27	0.25	0.00	3.48
Totals	0.60	\$118	\$11	\$10	\$0	\$139

```
=====
Line #      Description
-----
              Manhours   Matl     Labor   Equipment   Sub     Total
=====
U02 SITEWORK      1023       $118   $20,081   $5,484       $0   $25,683
0331305010      6" THICK SLAB FOR NEW TRANSFORMER
Unit values      0.02       1.45     0.28     0.00       48.00 S.F.  1.73
Totals           1.15       $70      $13      $0         $0      $83

U03 CONCRETE       2        $70      $13      $0         $0      $83
```

```

=====
Line #      Description
-----
      Manhours  Matl    Labor  Equipment  Sub      Total
=====

1554512050  HTG INFRA RED ELEC 6KW 20478BTU
Unit values      2.67    334.67    44.47      0.00      7.00 Ea.
Totals          18.67    $2,343    $311      $0      0.00    379.13
                                           $0      $2,654

1554512100  HTG INFRA RED ELEC 13.5KW 46075.5BTU
Unit values      3.20    455.20    53.24      0.00      7.00 Ea.
Totals          22.40    $3,186    $373      $0      0.00    508.44
                                           $0      $3,559

1554512150  HTG INFRA RED ELEC 27KW 92151BTU
Unit values      4.00    879.31    66.55      0.00      33.00 Ea.
Totals         132.00    $29,017    $2,196      $0      0.00    945.86
                                           $0      $31,213

1574205220  ELECTRIC THERMOSTAT W/ COVER AND WIRING
Unit values      1.00     74.93    20.81      0.00      40.00 Ea.
Totals          40.00    $2,997    $832      $0      0.00    95.74
                                           $0      $3,829

U15 MECHANICAL      214    $37,543    $3,712      $0      $0      $41,255

```

=====						
Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1611400600	MINERAL INSULATED CABLE 600V 1 #4					
					3.00 C.L.F.	
Unit values	6.67	402.81	103.21	0.00	0.00	506.02
Totals	20.00	\$1,208	\$310	\$0	\$0	\$1,518
1611400800	MINERAL INSULATED CABLE 600V 1 #2					
					6.00 C.L.F.	
Unit values	7.27	537.08	112.80	0.00	0.00	649.88
Totals	43.64	\$3,222	\$677	\$0	\$0	\$3,899
1621100220	OUTLET BOXES STEEL, 4" SQ, 2-1/8" DEEP, 1" K.O.'S					
					40.00 Ea.	
Unit values	0.40	2.36	6.20	0.00	0.00	8.57
Totals	16.00	\$94	\$248	\$0	\$0	\$342
1621100250	OUTLET BOX STEEL 4" COVERS BLANK					
					40.00 Ea.	
Unit values	0.13	0.54	1.94	0.00	0.00	2.48
Totals	5.00	\$21	\$78	\$0	\$0	\$99
1631200100	HEATING SYSTEM POWER / CONTROL PANEL					
					10.00 Ea.	
Unit values	2.96	320.72	45.97	0.00	0.00	366.69
Totals	29.63	\$3,207	\$460	\$0	\$0	\$3,667
1641600500	TRANSFORMER OIL PAD 15KV 480V 3P1000KVA					
					1.00 Ea.	
Unit values	76.92	17408.80	1184.40	225.60	0.00	18818.80
Totals	76.92	\$17,409	\$1,184	\$226	\$0	\$18,819
1671104800	UNDERGROUND DUCT BANK PVC TYPE EB 4 - 2" DIA					
					250.00 L.F.	
Unit values	0.13	1.48	2.07	0.00	0.00	3.55
Totals	33.25	\$370	\$517	\$0	\$0	\$887
U16 ELECTRICAL	225	\$25,531	\$3,474	\$226	\$0	\$29,231

```
=====
Line #      Description
-----
              Manhours   Matl      Labor    Equipment   Sub      Total
=====
```

ESTIMATE TOTAL	2897	\$114,563	\$58,694	\$5,710	\$0	\$178,967
SALES TAX	0.00%	\$0				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$114,563	\$58,694	\$5,710	\$0	\$178,967
CONTINGENCY	10.00%					\$17,897
BOND	0.00%					\$0
PROFIT	10.00%					\$17,897
JOB TOTAL						\$214,760

```

=====
Estimate:      BLDG  3007          Date:      28-Nov-94
Description:   ELECTRIC INFRARED HEATING SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG,N.C    Job #:      94013.04
Sq. footage:   31586             City indx:Raleigh, NC
=====

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SUMMARY

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-----
Manhours  Matl  Labor  Equipment  Sub  Total
=====
A09 ELECTRICAL  1433  $51,301  $31,414  $0  $0  $82,715
U02 SITEWORK    1023    $118  $20,081  $5,484  $0  $25,683
U03 CONCRETE     2     $70    $13    $0  $0  $83
U15 MECHANICAL  214  $37,543  $3,712  $0  $0  $41,255
U16 ELECTRICAL  225  $25,531  $3,474  $226  $0  $29,231

TOTAL          2897  $114,563  $58,694  $5,710  $0  $178,967

SALES TAX      0.00%    $0
MATL MARKUP    0.00%    $0
LABOR MARKUP   0.00%    $0
EQUIPT MARKUP  0.00%    $0
SUB MARKUP     0.00%    $0

TOTAL BEFORE CONTINGENC $114,563  $58,694  $5,710  $0  $178,967
CONTINGENCY      10.00%    $17,897
BOND              0.00%    $0
PROFIT           10.00%    $17,897

JOB TOTAL                                $214,760

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LIFE CYCLE COST ANALYSIS SUMMARY

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) STUDY: 3262ECO3
 LCCID FY95 (92)
 INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3
 PROJECT NO. & TITLE: 94013.04 LES: ECO3 - ELECTRIC INFRARED HEAT
 FISCAL YEAR 95 DISCRETE PORTION NAME: ECO
 ANALYSIS DATE: 12-05-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	164675.	
B. SIOH	\$	8234.	
C. DESIGN COST	\$	8234.	
D. TOTAL COST (1A+1B+1C)	\$	181143.	
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.	
F. PUBLIC UTILITY COMPANY REBATE	\$	0.	
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$	181143.	

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH (1)	SAVINGS MWH/YR (2)	ANNUAL \$ SAVINGS (3)	DISCOUNT FACTOR (4)	DISCOUNTED SAVINGS (5)
A. ELECT	\$ 34.95	-870.	\$ -30392.	15.08	\$ -458314.
B. DIST	\$ 19.18	2023.	\$ 38804.	18.57	\$ 720594.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	0.	\$ 0.	18.58	\$ 0.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ -41486.	14.88	\$ -617312.
N. TOTAL		1154.	\$ -33074.		\$ -355031.

3. NON ENERGY SAVINGS (+) / COST (-)

A. ANNUAL RECURRING (+/-)		\$ 2786.
(1) DISCOUNT FACTOR (TABLE A)	14.88	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$ 41455.

B. NON RECURRING SAVINGS (+) / COSTS (-)

ITEM	SAVINGS (+) COST (-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS (+) / COST (-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS (+) / COST (-) (3A2+3Bd4) \$ 41455.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ -30288.

5. SIMPLE PAYBACK PERIOD (1G/4) -5.98 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ -313577.

7. SAVINGS TO INVESTMENT RATIO (SIR) = (6 / 1G) = -1.73
 (IF < 1 PROJECT DOES NOT QUALIFY)

**** Project does not qualify for ECIP funding; 4,5,6 for information only.

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): N/A

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=====
Estimate:      BLDG 3262      Date:      28-Nov-94
Description:    ELECTRIC INFRARED HEATING SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG,N.C Job #:      94013.04
Sq. footage:   25877        City indx:Raleigh, NC
=====

```

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0913100280	FEEDER INSTALLATION, INCLUDING CONDUIT AND WIRE, 200 AMPERES					3000.00 L.F.	
Unit values		0.31	9.45	6.71	0.00	0.00	16.16
Totals		918.00	\$28,336	\$20,135	\$0	\$0	\$48,471
0914100280	SWITCHGEAR INST, INCL SWBD, PANELS & CIRC BKR, 800 AMPERES					1.00 EACH	
Unit values		96.93	7986.75	2129.10	0.00	0.00	10115.85
Totals		96.93	\$7,987	\$2,129	\$0	\$0	\$10,116
A09 ELECTRICAL		1015	\$36,323	\$22,264	\$0	\$0	\$58,587

=====						
Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
0205541750	PAVEMENT REMOVAL, BITUMINOUS, 4" TO 6" THICK					
					30.00 S.Y.	
Unit values	0.10	0.00	1.73	2.50	0.00	4.23
Totals	2.85	\$0	\$52	\$75	\$0	\$127
0205543200	SITE REMOVAL, STEEL PIPE, WELDED CONNECTION, 4" DIAMETER					
					2000.00 L.F.	
Unit values	0.15	0.00	2.61	1.06	0.00	3.68
Totals	300.00	\$0	\$5,225	\$2,128	\$0	\$7,353
0207183600	HVAC DEMO, MECH EQPT HEAVY ITEM					
					4.00 Ton	
Unit values	14.55	0.00	314.87	0.00	0.00	314.87
Totals	58.18	\$0	\$1,259	\$0	\$0	\$1,259
0208400600	REMOVE PIPE INSULATION UP TO 4" DIAMETER PIPE					
					2000.00 L.F.	
Unit values	0.07	0.00	1.63	0.20	0.00	1.83
Totals	142.00	\$0	\$3,268	\$391	\$0	\$3,659
0208401000	REMOVE INSULATION FROM PIPE FITTING, UP TO 4" DIAMETER PIPE					
					250.00 Ea.	
Unit values	0.20	0.00	4.60	0.56	0.00	5.16
Totals	50.00	\$0	\$1,149	\$140	\$0	\$1,289
0222540060	EXCAV TRENCH, COMMON EARTH, 1'-4' DEEP, 1/2 CY TRAC/LDR/B'HOE					
					20.00 C.Y.	
Unit values	0.08	0.00	1.47	1.17	0.00	2.64
Totals	1.60	\$0	\$29	\$23	\$0	\$52
0222541900	TAMPING TRENCH B'FILL, VIBRATING PLATE, ADD					
					20.00 C.Y.	
Unit values	0.09	0.00	1.44	0.55	0.00	1.99
Totals	1.78	\$0	\$29	\$11	\$0	\$40
0222543020	BACKFILL TRENCH, F.E. LOADER, WHEEL MTD., 1CY BUCKET, MIN HAUL					
					20.00 C.Y.	
Unit values	0.03	0.00	0.58	0.48	0.00	1.06
Totals	0.60	\$0	\$12	\$10	\$0	\$22
0251040380	ASPHALTIC CONCRETE PAVEMENT, PAVING, WEARING COURSE, 2" THICK					
					30.00 S.Y.	
Unit values	0.02	2.96	0.27	0.25	0.00	3.48
Totals	0.45	\$89	\$8	\$7	\$0	\$104

```
=====
Line #      Description
-----
              Manhours   Matl      Labor    Equipment   Sub      Total
=====
U02 SITEWORK      558        $89    $11,031    $2,785        $0    $13,905
0331305010      6" THICK SLAB FOR NEW TRANSFORMER
Unit values      0.02        1.45      0.28      0.00      48.00 S.F.  0.00    1.73
Totals           1.15        $70      $13       $0        $0        $83

U03 CONCRETE       2        $70      $13       $0        $0        $83
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=====
Line #      Description
-----
            Manhours  Matl    Labor   Equipment   Sub    Total
=====

1554512050   HTG INFRA RED ELEC 6KW 20478BTU
Unit values          2.67    334.67    44.47      0.00      10.00 Ea.
Totals              26.67    $3,347    $445        $0      0.00    379.13
                                   $0      $0      $3,792

1554512100   HTG INFRA RED ELEC 13.5KW 46075.5BTU
Unit values          3.20    455.20    53.24      0.00      10.00 Ea.
Totals              32.00    $4,552    $532        $0      0.00    508.44
                                   $0      $0      $5,084

1554512150   HTG INFRA RED ELEC 27KW 92151BTU
Unit values          4.00    879.31    66.55      0.00      26.00 Ea.
Totals             104.00    $22,862    $1,730      $0      0.00    945.86
                                   $0      $0      $24,592

1574205220   ELECTRIC THERMOSTAT W/ COVER AND WIRING
Unit values          1.00     74.93    20.81      0.00      36.00 Ea.
Totals              36.00    $2,697    $749        $0      0.00    95.74
                                   $0      $0      $3,446

U15 MECHANICAL      199    $33,458    $3,456      $0      $0    $36,914

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=====						
Line #	Description					

	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1611400600	MINERAL INSULATED CABLE 600V 1 #4				2.50 C.L.F.	
Unit values	6.67	402.81	103.21	0.00	0.00	506.02
Totals	16.67	\$1,007	\$258	\$0	\$0	\$1,265
1611400800	MINERAL INSULATED CABLE 600V 1 #2				5.00 C.L.F.	
Unit values	7.27	537.08	112.80	0.00	0.00	649.88
Totals	36.37	\$2,685	\$564	\$0	\$0	\$3,249
1621100220	OUTLET BOXES STEEL, 4" SQ, 2-1/8" DEEP, 1" K.O.'S				36.00 Ea.	
Unit values	0.40	2.36	6.20	0.00	0.00	8.57
Totals	14.40	\$85	\$223	\$0	\$0	\$308
1621100250	OUTLET BOX STEEL 4" COVERS BLANK				36.00 Ea.	
Unit values	0.13	0.54	1.94	0.00	0.00	2.48
Totals	4.50	\$19	\$70	\$0	\$0	\$89
1631200100	HEATING SYSTEM POWER / CONTROL PANEL				9.00 Ea.	
Unit values	2.96	320.72	45.97	0.00	0.00	366.69
Totals	26.67	\$2,886	\$414	\$0	\$0	\$3,300
1641600500	TRANSFORMER OIL PAD 15KV 480V 3P1000KVA				1.00 Ea.	
Unit values	76.92	17408.80	1184.40	225.60	0.00	18818.80
Totals	76.92	\$17,409	\$1,184	\$226	\$0	\$18,819
1671104800	UNDERGROUND DUCT BANK PVC TYPE EB 4 - 2" DIA				200.00 L.F.	
Unit values	0.13	1.48	2.07	0.00	0.00	3.55
Totals	26.60	\$296	\$414	\$0	\$0	\$710
U16 ELECTRICAL	203	\$24,387	\$3,127	\$226	\$0	\$27,740

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=====
Line #      Description
-----
              Manhours   Matl     Labor   Equipment   Sub     Total
=====
```

ESTIMATE TOTAL	1977	\$94,327	\$39,891	\$3,011	\$0	\$137,229
SALES TAX	0.00%	\$0				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$94,327	\$39,891	\$3,011	\$0	\$137,229
CONTINGENCY	10.00%					\$13,723
BOND	0.00%					\$0
PROFIT	10.00%					\$13,723
JOB TOTAL						\$164,675

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=====
Estimate:      BLDG 3262      Date:      28-Nov-94
Description:   ELECTRIC INFRARED HEATING SYSTEM COST ESTIMATE
Project:      LIMITED EEAP(HGR) Bid Date:
Location:     FORT BRAGG,N.C  Job #:      94013.04
Sq. footage:  25877          City indx:Raleigh, NC
=====

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SUMMARY

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              Manhours   Matl      Labor    Equipment    Sub      Total
=====
A09 ELECTRICAL      1015    $36,323    $22,264         $0         $0    $58,587
U02 SITEWORK        558         $89    $11,031    $2,785         $0    $13,905
U03 CONCRETE         2         $70         $13         $0         $0         $83
U15 MECHANICAL      199    $33,458    $3,456         $0         $0    $36,914
U16 ELECTRICAL      203    $24,387    $3,127    $226         $0    $27,740

TOTAL              1977    $94,327    $39,891    $3,011         $0    $137,229

SALES TAX           0.00%         $0
MATL MARKUP         0.00%         $0
LABOR MARKUP        0.00%         $0
EQUIPT MARKUP       0.00%         $0
SUB MARKUP          0.00%         $0

TOTAL BEFORE CONTINGENC $94,327    $39,891    $3,011         $0    $137,229
CONTINGENCY          10.00%         $13,723
BOND                  0.00%         $0
PROFIT               10.00%         $13,723

JOB TOTAL                                     $164,675

```


LIFE CYCLE COST ANALYSIS SUMMARY

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) STUDY: 3354ECO3
 INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 LCCID FY95 (92)
 PROJECT NO. & TITLE: 94013.04 LES: ECO3 - ELECTRIC INFRARED HEAT
 FISCAL YEAR 95 DISCRETE PORTION NAME: ECO
 ANALYSIS DATE: 12-05-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	105584.		
B. SIOH	\$	5279.		
C. DESIGN COST	\$	5279.		
D. TOTAL COST (1A+1B+1C)	\$	116142.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$		0.	
F. PUBLIC UTILITY COMPANY REBATE	\$		0.	
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$			116142.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	-130.	\$ -4545.	15.08	\$ -68532.
B. DIST	\$ 19.18	828.	\$ 15885.	18.57	\$ 294986.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	0.	\$ 0.	18.58	\$ 0.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ -24975.	14.88	\$ -371628.
N. TOTAL		698.	\$ -13634.		\$ -145174.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$	5189.
(1) DISCOUNT FACTOR (TABLE A)		14.88	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$	77210.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-) (3A2+3Bd4) \$ 77210.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ -8446.

5. SIMPLE PAYBACK PERIOD (1G/4) -13.75 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ -67964.

7. SAVINGS TO INVESTMENT RATIO (SIR)=(6 / 1G)= - .59
 (IF < 1 PROJECT DOES NOT QUALIFY)

**** Project does not qualify for ECIP funding; 4,5,6 for information only.

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): N/A

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=====
Estimate:      BLDG 3354      Date:      28-Nov-94
Description:    ELECTRIC INFRARED HEATING SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG,N.C Job #:      94013.04
Sq. footage:   19500        City indx:Raleigh, NC
=====

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Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0913100280	FEEDER INSTALLATION, INCLUDING CONDUIT AND WIRE, 200 AMPERES					2000.00 L.F.	
Unit values		0.31	9.45	6.71	0.00	0.00	16.16
Totals		612.00	\$18,890	\$13,423	\$0	\$0	\$32,313
0914100200	SWITCHGEAR INST, INCL SWBD, PANELS & CIRC BKR, 400 AMPS					1.00 EACH	
Unit values		50.36	2731.70	1099.80	0.00	0.00	3831.50
Totals		50.36	\$2,732	\$1,100	\$0	\$0	\$3,832
A09 ELECTRICAL		663	\$21,622	\$14,523	\$0	\$0	\$36,145

Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
0205541750	PAVEMENT REMOVAL, BITUMINOUS, 4" TO 6" THICK					
					30.00 S.Y.	
Unit values	0.10	0.00	1.73	2.50	0.00	4.23
Totals	2.85	\$0	\$52	\$75	\$0	\$127
0205543200	SITE REMOVAL, STEEL PIPE, WELDED CONNECTION, 4" DIAMETER					
					1600.00 L.F.	
Unit values	0.15	0.00	2.61	1.06	0.00	3.68
Totals	240.00	\$0	\$4,180	\$1,702	\$0	\$5,882
0207183600	HVAC DEMO, MECH EQPT HEAVY ITEM					
					1.50 Ton	
Unit values	14.55	0.00	314.87	0.00	0.00	314.87
Totals	21.82	\$0	\$472	\$0	\$0	\$472
0208400600	REMOVE PIPE INSULATION UP TO 4" DIAMETER PIPE					
					1400.00 L.F.	
Unit values	0.07	0.00	1.63	0.20	0.00	1.83
Totals	99.40	\$0	\$2,287	\$274	\$0	\$2,561
0208401000	REMOVE INSULATION FROM PIPE FITTING, UP TO 4" DIAMETER PIPE					
					160.00 Ea.	
Unit values	0.20	0.00	4.60	0.56	0.00	5.16
Totals	32.00	\$0	\$735	\$90	\$0	\$825
0222540060	EXCAV TRENCH, COMMON EARTH, 1'-4' DEEP, 1/2 CY TRAC/LDR/B'HOE					
					15.00 C.Y.	
Unit values	0.08	0.00	1.47	1.17	0.00	2.64
Totals	1.20	\$0	\$22	\$17	\$0	\$39
0222541900	TAMPING TRENCH B'FILL, VIBRATING PLATE, ADD					
					15.00 C.Y.	
Unit values	0.09	0.00	1.44	0.55	0.00	1.99
Totals	1.34	\$0	\$22	\$8	\$0	\$30
0222543020	BACKFILL TRENCH, F.E. LOADER, WHEEL MTD., 1CY BUCKET, MIN HAUL					
					15.00 C.Y.	
Unit values	0.03	0.00	0.58	0.48	0.00	1.06
Totals	0.45	\$0	\$9	\$7	\$0	\$16
0251040380	ASPHALTIC CONCRETE PAVEMENT, PAVING, WEARING COURSE, 2" THICK					
					30.00 S.Y.	
Unit values	0.02	2.96	0.27	0.25	0.00	3.48
Totals	0.45	\$89	\$8	\$7	\$0	\$104

```
=====
Line #      Description
-----
              Manhours   Matl      Labor    Equipment   Sub      Total
=====
U02 SITEWORK      400        $89     $7,787     $2,180        $0    $10,056
0331305010      6" THICK SLAB FOR NEW TRANSFORMER
Unit values      0.02        1.45     0.28        0.00      48.00 S.F.  1.73
Totals           1.15        $70      $13         $0         $0      $83

U03 CONCRETE       2         $70      $13         $0         $0      $83
```

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=====
Line #      Description
-----
            Manhours   Matl      Labor   Equipment   Sub      Total
=====
```

1554512150 HTG INFRA RED ELEC 27KW 92151BTU 20.00 Ea.

Unit values	4.00	879.31	66.55	0.00	0.00	945.86
Totals	80.00	\$17,586	\$1,331	\$0	\$0	\$18,917

1574205220 ELECTRIC THERMOSTAT W/ COVER AND WIRING 20.00 Ea.

Unit values	1.00	74.93	20.81	0.00	0.00	95.74
Totals	20.00	\$1,499	\$416	\$0	\$0	\$1,915

U15 MECHANICAL 100 \$19,085 \$1,747 \$0 \$0 \$20,832

Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1611400600	MINERAL INSULATED CABLE 600V 1 #4					
					2.50 C.L.F.	
Unit values	6.67	402.81	103.21	0.00	0.00	506.02
Totals	16.67	\$1,007	\$258	\$0	\$0	\$1,265
1611400800	MINERAL INSULATED CABLE 600V 1 #2					
					5.00 C.L.F.	
Unit values	7.27	537.08	112.80	0.00	0.00	649.88
Totals	36.37	\$2,685	\$564	\$0	\$0	\$3,249
1621100220	OUTLET BOXES STEEL, 4" SQ, 2-1/8" DEEP, 1" K.O.'S					
					20.00 Ea.	
Unit values	0.40	2.36	6.20	0.00	0.00	8.57
Totals	8.00	\$47	\$124	\$0	\$0	\$171
1621100250	OUTLET BOX STEEL 4" COVERS BLANK					
					20.00 Ea.	
Unit values	0.13	0.54	1.94	0.00	0.00	2.48
Totals	2.50	\$11	\$39	\$0	\$0	\$50
1631200100	HEATING SYSTEM POWER / CONTROL PANEL					
					7.00 Ea.	
Unit values	2.96	320.72	45.97	0.00	0.00	366.69
Totals	20.74	\$2,245	\$322	\$0	\$0	\$2,567
1641600300	TRANSFORMER OIL PAD 15KV 480V 3P500KVA					
					1.00 Ea.	
Unit values	50.00	11760.20	775.50	146.08	0.00	12681.78
Totals	50.00	\$11,760	\$776	\$146	\$0	\$12,682
1671104800	UNDERGROUND DUCT BANK PVC TYPE EB 4 - 2" DIA					
					250.00 L.F.	
Unit values	0.13	1.48	2.07	0.00	0.00	3.55
Totals	33.25	\$370	\$517	\$0	\$0	\$887
U16 ELECTRICAL	168	\$18,125	\$2,600	\$146	\$0	\$20,871

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=====
Line #      Description
-----
      Manhours   Matl    Labor   Equipment   Sub    Total
=====
```

ESTIMATE TOTAL	1333	\$58,991	\$26,670	\$2,326	\$0	\$87,987
SALES TAX	0.00%	\$0				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$58,991	\$26,670	\$2,326	\$0	\$87,987
CONTINGENCY	10.00%					\$8,799
BOND	0.00%					\$0
PROFIT	10.00%					\$8,799
JOB TOTAL						\$105,584

```

=====
Estimate:      BLDG 3354      Date:      28-Nov-94
Description:   ELECTRIC INFRARED HEATING SYSTEM COST ESTIMATE
Project:      LIMITED EEAP(HGR) Bid Date:
Location:     FORT BRAGG,N.C  Job #:      94013.04
Sq. footage:  19500          City indx:Raleigh, NC
=====

```

SUMMARY

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-----
              Manhours   Matl      Labor    Equipment    Sub      Total
=====
A09 ELECTRICAL      663    $21,622    $14,523          $0          $0    $36,145
U02 SITEWORK        400          $89    $7,787    $2,180          $0    $10,056
U03 CONCRETE         2          $70    $13          $0          $0      $83
U15 MECHANICAL     100    $19,085    $1,747          $0          $0    $20,832
U16 ELECTRICAL     168    $18,125    $2,600    $146          $0    $20,871

TOTAL              1333    $58,991    $26,670    $2,326          $0    $87,987

SALES TAX           0.00%          $0
MATL MARKUP         0.00%          $0
LABOR MARKUP        0.00%          $0
EQUIPT MARKUP       0.00%          $0
SUB MARKUP          0.00%          $0

TOTAL BEFORE CONTINGENC $58,991    $26,670    $2,326          $0    $87,987
CONTINGENCY         10.00%          $0
BOND                0.00%          $0
PROFIT              10.00%          $0

JOB TOTAL                                          $105,584

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LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 3637ECO3

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) LCCID FY95 (92)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 94013.04 LES: ECO3 - ELECTRIC INFRARED HEAT

FISCAL YEAR 95 DISCRETE PORTION NAME: ECO

ANALYSIS DATE: 12-05-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	91571.		
B. SIOH	\$	4579.		
C. DESIGN COST	\$	4579.		
D. TOTAL COST (1A+1B+1C)	\$	100729.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$		0.	
F. PUBLIC UTILITY COMPANY REBATE	\$		0.	
G. TOTAL INVESTMENT (1D - 1E - 1F)				\$ 100729.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	-119.	\$ -4172.	15.08	\$ -62913.
B. DIST	\$ 19.18	883.	\$ 16937.	18.57	\$ 314522.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	0.	\$ 0.	18.58	\$ 0.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ -19494.	14.88	\$ -290071.
N. TOTAL		764.	\$ -6729.		\$ -38462.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)			
(1) DISCOUNT FACTOR (TABLE A)		14.88	\$ 300.
(2) DISCOUNTED SAVING/COST (3A X 3A1)			\$ 4464.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+) COST(-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-) (3A2+3Bd4) \$ 4464.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ -6429.

5. SIMPLE PAYBACK PERIOD (1G/4) -15.67 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ -33998.

7. SAVINGS TO INVESTMENT RATIO (SIR) = $(6 / 1G) =$ -.34
(IF < 1 PROJECT DOES NOT QUALIFY)

**** Project does not qualify for ECIP funding; 4,5,6 for information only.

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): N/A

```

=====
Estimate:      BLDG 3637      Date:      28-Nov-94
Description:    ELECTRIC INFRARED HEATING SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG,N.C  Job #:      94013.04
Sq. footage:   12000        City indx:Raleigh, NC
=====

```

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0913100280	FEEDER INSTALLATION, INCLUDING CONDUIT AND WIRE, 200 AMPERES					1800.00 L.F.	
Unit values		0.31	9.45	6.71	0.00	0.00	16.16
Totals		550.80	\$17,001	\$12,081	\$0	\$0	\$29,082
0914100200	SWITCHGEAR INST, INCL SWBD, PANELS & CIRC BKR, 400 AMPS					1.00 EACH	
Unit values		50.36	2731.70	1099.80	0.00	0.00	3831.50
Totals		50.36	\$2,732	\$1,100	\$0	\$0	\$3,832
A09 ELECTRICAL		602	\$19,733	\$13,181	\$0	\$0	\$32,914

=====						
Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
0205541750	PAVEMENT REMOVAL, BITUMINOUS, 4" TO 6" THICK					
					20.00 S.Y.	
Unit values	0.10	0.00	1.73	2.50	0.00	4.23
Totals	1.90	\$0	\$35	\$50	\$0	\$85
0205543200	SITE REMOVAL, STEEL PIPE, WELDED CONNECTION, 4" DIAMETER					
					1000.00 L.F.	
Unit values	0.15	0.00	2.61	1.06	0.00	3.68
Totals	150.00	\$0	\$2,613	\$1,064	\$0	\$3,677
0207183600	HVAC DEMO, MECH EQPT HEAVY ITEM					
					1.00 Ton	
Unit values	14.55	0.00	314.87	0.00	0.00	314.87
Totals	14.55	\$0	\$315	\$0	\$0	\$315
0208400600	REMOVE PIPE INSULATION UP TO 4" DIAMETER PIPE					
					1000.00 L.F.	
Unit values	0.07	0.00	1.63	0.20	0.00	1.83
Totals	71.00	\$0	\$1,634	\$196	\$0	\$1,830
0208401000	REMOVE INSULATION FROM PIPE FITTING, UP TO 4" DIAMETER PIPE					
					125.00 Ea.	
Unit values	0.20	0.00	4.60	0.56	0.00	5.16
Totals	25.00	\$0	\$574	\$70	\$0	\$644
0222540060	EXCAV TRENCH, COMMON EARTH, 1'-4' DEEP, 1/2 CY TRAC/LDR/B'HOE					
					15.00 C.Y.	
Unit values	0.08	0.00	1.47	1.17	0.00	2.64
Totals	1.20	\$0	\$22	\$17	\$0	\$39
0222541900	TAMPING TRENCH B'FILL, VIBRATING PLATE, ADD					
					15.00 C.Y.	
Unit values	0.09	0.00	1.44	0.55	0.00	1.99
Totals	1.34	\$0	\$22	\$8	\$0	\$30
0222543020	BACKFILL TRENCH, F.E. LOADER, WHEEL MTD., 1 CY BUCKET, MIN HAUL					
					15.00 C.Y.	
Unit values	0.03	0.00	0.58	0.48	0.00	1.06
Totals	0.45	\$0	\$9	\$7	\$0	\$16
0251040380	ASPHALTIC CONCRETE PAVEMENT, PAVING, WEARING COURSE, 2" THICK					
					20.00 S.Y.	
Unit values	0.02	2.96	0.27	0.25	0.00	3.48
Totals	0.30	\$59	\$5	\$5	\$0	\$69

```
=====
Line #      Description
-----
              Manhours   Matl      Labor    Equipment   Sub      Total
=====
U02 SITEWORK      266        $59     $5,229    $1,417        $0     $6,705
0331305010      6" THICK SLAB FOR NEW TRANSFORMER
Unit values      0.02        1.45     0.28      0.00      48.00 S.F.  1.73
Totals           1.15        $70     $13       $0         $0       $83

U03 CONCRETE       2        $70     $13       $0         $0       $83
```

=====						
Line #	Description					

	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1554512050	HTG INFRA RED ELEC 6KW 20478BTU					
					5.00 Ea.	
Unit values	2.67	334.67	44.47	0.00	0.00	379.13
Totals	13.34	\$1,673	\$222	\$0	\$0	\$1,895
1554512100	HTG INFRA RED ELEC 13.5KW 46075.5BTU					
					5.00 Ea.	
Unit values	3.20	455.20	53.24	0.00	0.00	508.44
Totals	16.00	\$2,276	\$266	\$0	\$0	\$2,542
1554512150	HTG INFRA RED ELEC 27KW 92151BTU					
					12.00 Ea.	
Unit values	4.00	879.31	66.55	0.00	0.00	945.86
Totals	48.00	\$10,552	\$799	\$0	\$0	\$11,351
1574205220	ELECTRIC THERMOSTAT W/ COVER AND WIRING					
					22.00 Ea.	
Unit values	1.00	74.93	20.81	0.00	0.00	95.74
Totals	22.00	\$1,648	\$458	\$0	\$0	\$2,106
U15 MECHANICAL	100	\$16,149	\$1,745	\$0	\$0	\$17,894

Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1611400600	MINERAL INSULATED CABLE 600V 1 #4				2.00	C.L.F.
Unit values	6.67	402.81	103.21	0.00	0.00	506.02
Totals	13.33	\$806	\$206	\$0	\$0	\$1,012
=====						
1611400800	MINERAL INSULATED CABLE 600V 1 #2				4.00	C.L.F.
Unit values	7.27	537.08	112.80	0.00	0.00	649.88
Totals	29.09	\$2,148	\$451	\$0	\$0	\$2,599
=====						
1621100220	OUTLET BOXES STEEL, 4" SQ, 2-1/8" DEEP, 1" K.O.'S				22.00	Ea.
Unit values	0.40	2.36	6.20	0.00	0.00	8.57
Totals	8.80	\$52	\$136	\$0	\$0	\$188
=====						
1621100250	OUTLET BOX STEEL 4" COVERS BLANK				22.00	Ea.
Unit values	0.13	0.54	1.94	0.00	0.00	2.48
Totals	2.75	\$12	\$43	\$0	\$0	\$55
=====						
1631200100	HEATING SYSTEM POWER / CONTROL PANEL				4.00	Ea.
Unit values	2.96	320.72	45.97	0.00	0.00	366.69
Totals	11.85	\$1,283	\$184	\$0	\$0	\$1,467
=====						
1641600300	TRANSFORMER OIL PAD 15KV 480V 3P500KVA				1.00	Ea.
Unit values	50.00	11760.20	775.50	146.08	0.00	12681.78
Totals	50.00	\$11,760	\$776	\$146	\$0	\$12,682
=====						
1671104800	UNDERGROUND DUCT BANK PVC TYPE EB 4 - 2" DIA				200.00	L.F.
Unit values	0.13	1.48	2.07	0.00	0.00	3.55
Totals	26.60	\$296	\$414	\$0	\$0	\$710
=====						
U16 ELECTRICAL	143	\$16,357	\$2,210	\$146	\$0	\$18,713

```
=====
Line #      Description
-----
      Manhours   Matl    Labor   Equipment   Sub    Total
=====
```

ESTIMATE TOTAL	1113	\$52,368	\$22,378	\$1,563	\$0	\$76,309
SALES TAX	0.00%	\$0				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$52,368	\$22,378	\$1,563	\$0	\$76,309
CONTINGENCY	10.00%					\$7,631
BOND	0.00%					\$0
PROFIT	10.00%					\$7,631
JOB TOTAL						\$91,571

```

=====
Estimate:      BLDG  3637      Date:      28-Nov-94
Description:    ELECTRIC INFRARED HEATING SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG,N.C  Job #:      94013.04
Sq. footage:   12000          City indx:Raleigh, NC
=====

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SUMMARY

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-----
Manhours  Matl  Labor  Equipment  Sub  Total
=====
A09 ELECTRICAL      602   $19,733   $13,181         $0         $0   $32,914
U02 SITEWORK        266     $59     $5,229   $1,417         $0     $6,705
U03 CONCRETE         2      $70      $13         $0         $0      $83
U15 MECHANICAL      100   $16,149   $1,745         $0         $0   $17,894
U16 ELECTRICAL      143   $16,357   $2,210    $146         $0   $18,713

TOTAL              1113   $52,368   $22,378   $1,563         $0   $76,309

SALES TAX           0.00%         $0
MATL MARKUP         0.00%         $0
LABOR MARKUP        0.00%         $0
EQUIPT MARKUP       0.00%         $0
SUB MARKUP          0.00%         $0

TOTAL BEFORE CONTINGENC $52,368   $22,378   $1,563         $0   $76,309
CONTINGENCY          10.00%         $7,631
BOND                 0.00%         $0
PROFIT               10.00%         $7,631

JOB TOTAL                                     $91,571

```


LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 3642ECO3

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) LCCID FY95 (92)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 94013.04 LES: ECO3 - ELECTRIC INFRARED HEAT

FISCAL YEAR 95 DISCRETE PORTION NAME: ECO

ANALYSIS DATE: 12-05-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	144029.	
B. SIOH	\$	7201.	
C. DESIGN COST	\$	7201.	
D. TOTAL COST (1A+1B+1C)	\$	158431.	
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.	
F. PUBLIC UTILITY COMPANY REBATE	\$	0.	
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$		158431.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	-210.	\$ -7336.	15.08	\$ -110632.
B. DIST	\$ 19.18	1021.	\$ 19578.	18.57	\$ 363563.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	0.	\$ 0.	18.58	\$ 0.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ -29484.	14.88	\$ -438722.
N. TOTAL		811.	\$ -17242.		\$ -185791.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$	1043.
(1) DISCOUNT FACTOR (TABLE A)		14.88	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$	15521.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-) (4)
d. TOTAL	\$	0.		0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-) (3A2+3Bd4) \$ 15521.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ -16199.

5. SIMPLE PAYBACK PERIOD (1G/4) -9.78 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ -170270.

7. SAVINGS TO INVESTMENT RATIO (SIR)=(6 / 1G)= -1.07
(IF < 1 PROJECT DOES NOT QUALIFY)

**** Project does not qualify for ECIP funding; 4,5,6 for information only.

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): N/A

```

=====
Estimate:      BLDG 3642      Date:      28-Nov-94
Description:    ELECTRIC INFRARED HEATING SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG,N.C Job #:      94013.04
Sq. footage:   19500        City indx:Raleigh, NC
=====

```

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0913100280	FEEDER INSTALLATION, INCLUDING CONDUIT AND WIRE, 200 AMPERES					3000.00 L.F.	
Unit values		0.31	9.45	6.71	0.00	0.00	16.16
Totals		918.00	\$28,336	\$20,135	\$0	\$0	\$48,471
0914100240	SWITCHGEAR INST, INCL SWBD, PANELS & CIRC BKR, 600 AMPERES					1.00 EACH	
Unit values		68.07	6574.60	1494.60	0.00	0.00	8069.20
Totals		68.07	\$6,575	\$1,495	\$0	\$0	\$8,070
A09 ELECTRICAL		987	\$34,911	\$21,630	\$0	\$0	\$56,541

```

=====
Line #      Description
-----
Manhours   Matl      Labor   Equipment   Sub      Total
=====

0205541750  PAVEMENT REMOVAL, BITUMINOUS, 4" TO 6" THICK
Unit values      0.10      0.00      1.73      2.50      30.00 S.Y.      4.23
Totals           2.85      $0      $52      $75      $0      $127

0205543200  SITE REMOVAL, STEEL PIPE, WELDED CONNECTION,
4" DIAMETER
Unit values      0.15      0.00      2.61      1.06      1600.00 L.F.      3.68
Totals          240.00      $0      $4,180      $1,702      $0      $5,882

0207183600  HVAC DEMO, MECH EQPT HEAVY ITEM
Unit values      14.55      0.00      314.87      0.00      1.50 Ton      314.87
Totals           21.82      $0      $472      $0      $0      $472

0208400600  REMOVE PIPE INSULATION UP TO 4" DIAMETER PIPE
Unit values      0.07      0.00      1.63      0.20      1400.00 L.F.      1.83
Totals           99.40      $0      $2,287      $274      $0      $2,561

0208401000  REMOVE INSULATION FROM PIPE FITTING, UP TO 4"
DIAMETER PIPE
Unit values      0.20      0.00      4.60      0.56      160.00 Ea.      5.16
Totals           32.00      $0      $735      $90      $0      $825

0222540060  EXCAV TRENCH, COMMON EARTH, 1'-4' DEEP, 1/2
CY TRAC/LDR/B'HOE
Unit values      0.08      0.00      1.47      1.17      15.00 C.Y.      2.64
Totals           1.20      $0      $22      $17      $0      $39

0222541900  TAMPING TRENCH B'FILL, VIBRATING PLATE, ADD
Unit values      0.09      0.00      1.44      0.55      15.00 C.Y.      1.99
Totals           1.34      $0      $22      $8      $0      $30

0222543020  BACKFILL TRENCH, F.E. LOADER, WHEEL MTD., 1CY
BUCKET, MIN HAUL
Unit values      0.03      0.00      0.58      0.48      15.00 C.Y.      1.06
Totals           0.45      $0      $9      $7      $0      $16

0251040380  ASPHALTIC CONCRETE PAVEMENT, PAVING, WEARING
COURSE, 2" THICK
Unit values      0.02      2.96      0.27      0.25      30.00 S.Y.      3.48
Totals           0.45      $89      $8      $7      $0      $104

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```
=====
Line #      Description
-----
      Manhours  Matl    Labor  Equipment  Sub    Total
=====
U02 SITEWORK      400      $89    $7,787    $2,180      $0    $10,056
0331305010      6" THICK SLAB FOR NEW TRANSFORMER
Unit values      0.02      1.45      0.28      0.00      48.00 S.F.  1.73
Totals           1.15      $70      $13      $0      $0      $83

U03 CONCRETE      2      $70      $13      $0      $0      $83
=====
```

```

=====
Line #      Description
-----
           Manhours   Matl      Labor   Equipment   Sub      Total
=====

1554512050  HTG INFRA RED ELEC 6KW 20478BTU
Unit values      2.67    334.67    44.47      0.00      5.00 Ea.
Totals           13.34    $1,673    $222      $0      0.00    379.13
                                           $0      $1,895

1554512100  HTG INFRA RED ELEC 13.5KW 46075.5BTU
Unit values      3.20    455.20    53.24      0.00      5.00 Ea.
Totals           16.00    $2,276    $266      $0      0.00    508.44
                                           $0      $2,542

1554512150  HTG INFRA RED ELEC 27KW 92151BTU
Unit values      4.00    879.31    66.55      0.00      20.00 Ea.
Totals           80.00    $17,586    $1,331     $0      0.00    945.86
                                           $0      $18,917

1574205220  ELECTRIC THERMOSTAT W/ COVER AND WIRING
Unit values      1.00     74.93    20.81      0.00      30.00 Ea.
Totals           30.00    $2,248    $624      $0      0.00    95.74
                                           $0      $2,872

U15 MECHANICAL      140    $23,783    $2,443      $0      $0      $26,226

```

Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1611400600	MINERAL INSULATED CABLE 600V 1 #4					2.50 C.L.F.
Unit values	6.67	402.81	103.21	0.00	0.00	506.02
Totals	16.67	\$1,007	\$258	\$0	\$0	\$1,265
1611400800	MINERAL INSULATED CABLE 600V 1 #2					5.00 C.L.F.
Unit values	7.27	537.08	112.80	0.00	0.00	649.88
Totals	36.37	\$2,685	\$564	\$0	\$0	\$3,249
1621100220	OUTLET BOXES STEEL, 4" SQ, 2-1/8" DEEP, 1" K.O.'S					30.00 Ea.
Unit values	0.40	2.36	6.20	0.00	0.00	8.57
Totals	12.00	\$71	\$186	\$0	\$0	\$257
1621100250	OUTLET BOX STEEL 4" COVERS BLANK					30.00 Ea.
Unit values	0.13	0.54	1.94	0.00	0.00	2.48
Totals	3.75	\$16	\$58	\$0	\$0	\$74
1631200100	HEATING SYSTEM POWER / CONTROL PANEL					7.00 Ea.
Unit values	2.96	320.72	45.97	0.00	0.00	366.69
Totals	20.74	\$2,245	\$322	\$0	\$0	\$2,567
1641600500	TRANSFORMER OIL PAD 15KV 480V 3P1000KVA					1.00 Ea.
Unit values	76.92	17408.80	1184.40	225.60	0.00	18818.80
Totals	76.92	\$17,409	\$1,184	\$226	\$0	\$18,819
1671104800	UNDERGROUND DUCT BANK PVC TYPE EB 4 - 2" DIA					250.00 L.F.
Unit values	0.13	1.48	2.07	0.00	0.00	3.55
Totals	33.25	\$370	\$517	\$0	\$0	\$887
U16 ELECTRICAL	200	\$23,803	\$3,089	\$226	\$0	\$27,118

```
=====
Line #      Description
-----
              Manhours   Matl      Labor    Equipment   Sub      Total
=====
```

ESTIMATE TOTAL	1729	\$82,656	\$34,962	\$2,406	\$0	\$120,024
SALES TAX	0.00%	\$0				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$82,656	\$34,962	\$2,406	\$0	\$120,024
CONTINGENCY	10.00%					\$12,002
BOND	0.00%					\$0
PROFIT	10.00%					\$12,002
JOB TOTAL						\$144,029

```

=====
Estimate:      BLDG 3642      Date:      28-Nov-94
Description:   ELECTRIC INFRARED HEATING SYSTEM COST ESTIMATE
Project:      LIMITED EEAP(HGR) Bid Date:
Location:     FORT BRAGG,N.C  Job #:      94013.04
Sq. footage:  19500          City indx:Raleigh, NC
=====

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SUMMARY

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-----
              Manhours   Matl     Labor   Equipment   Sub       Total
=====
A09 ELECTRICAL      987    $34,911  $21,630         $0         $0    $56,541
U02 SITEWORK        400         $89    $7,787    $2,180         $0    $10,056
U03 CONCRETE         2         $70     $13         $0         $0     $83
U15 MECHANICAL     140    $23,783  $2,443         $0         $0    $26,226
U16 ELECTRICAL     200    $23,803  $3,089    $226         $0    $27,118

TOTAL              1729    $82,656  $34,962    $2,406         $0    $120,024

SALES TAX           0.00%         $0
MATL MARKUP         0.00%         $0
LABOR MARKUP        0.00%         $0
EQUIPT MARKUP       0.00%         $0
SUB MARKUP          0.00%         $0

TOTAL BEFORE CONTINGENC  $82,656  $34,962    $2,406         $0    $120,024
CONTINGENCY          10.00%                $12,002
BOND                  0.00%                $0
PROFIT                10.00%                $12,002

JOB TOTAL                                           $144,029

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LIFE CYCLE COST ANALYSIS SUMMARY

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) STUDY: 3807ECO3
 INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 LCCID FY95 (92)
 PROJECT NO. & TITLE: 94013.04 LES: ECO3 - ELECTRIC INFRARED HEAT
 FISCAL YEAR 95 DISCRETE PORTION NAME: ECO
 ANALYSIS DATE: 12-05-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	214760.		
B. SIOH	\$	10738.		
C. DESIGN COST	\$	10738.		
D. TOTAL COST (1A+1B+1C)	\$	236236.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.		
F. PUBLIC UTILITY COMPANY REBATE	\$	0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)			\$	236236.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	-288.	\$ -10059.	15.08	\$ -151689.
B. DIST	\$ 19.18	1948.	\$ 37359.	18.57	\$ 693764.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	0.	\$ 0.	18.58	\$ 0.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ -47522.	14.88	\$ -707127.
N. TOTAL		1660.	\$ -20222.		\$ -165053.

3. NON ENERGY SAVINGS (+) / COST (-)

A. ANNUAL RECURRING (+/-)		\$	300.
(1) DISCOUNT FACTOR (TABLE A)	14.88		
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$	4464.

B. NON RECURRING SAVINGS (+) / COSTS (-)

ITEM	SAVINGS (+) COST (-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS (+) / COST (-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS (+) / COST (-) (3A2+3Bd4) \$ 4464.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ -19922.

5. SIMPLE PAYBACK PERIOD (1G/4) -11.86 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ -160589.

7. SAVINGS TO INVESTMENT RATIO (SIR) = $(6 / 1G) =$ - .68
 (IF < 1 PROJECT DOES NOT QUALIFY)

**** Project does not qualify for ECIP funding; 4,5,6 for information only.

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): N/A

```

=====
Estimate:      BLDG 3807          Date:      28-Nov-94
Description:    ELECTRIC INFRARED HEATING SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG,N.C   Job #:      94013.04
Sq. footage:   31586           City indx:Raleigh, NC
=====

```

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0913100280	FEEDER INSTALLATION, INCLUDING CONDUIT AND WIRE, 200 AMPERES					4000.00 L.F.	
Unit values		0.31	9.45	6.71	0.00	0.00	16.16
Totals		1224.00	\$37,781	\$26,846	\$0	\$0	\$64,627
0914100360	SWITCHGEAR INST, INCL SWBD, PANELS & CIRC BKR, 1600 AMPERES					1.00 EACH	
Unit values		208.17	13519.60	4568.40	0.00	0.00	18088.00
Totals		208.17	\$13,520	\$4,568	\$0	\$0	\$18,088
A09 ELECTRICAL		1433	\$51,301	\$31,414	\$0	\$0	\$82,715

```

=====
Line #      Description
-----
Manhours   Matl     Labor    Equipment   Sub      Total
=====

0205541750  PAVEMENT REMOVAL, BITUMINOUS, 4" TO 6" THICK
Unit values      0.10      0.00      1.73      2.50      40.00 S.Y.
Totals           3.80      $0        $69      $100      $0      4.23
                                           $0      $169

0205543200  SITE REMOVAL, STEEL PIPE, WELDED CONNECTION,
4" DIAMETER
Unit values      0.15      0.00      2.61      1.06      4000.00 L.F.
Totals          600.00      $0     $10,450    $4,255      $0      3.68
                                           $0     $14,705

0207183600  HVAC DEMO, MECH EQPT HEAVY ITEM
Unit values      14.55      0.00     314.87      0.00      2.00 Ton
Totals           29.09      $0      $630      $0      0.00      314.87
                                           $0      $630

0208400600  REMOVE PIPE INSULATION UP TO 4" DIAMETER PIPE
Unit values      0.07      0.00      1.63      0.20      4000.00 L.F.
Totals          284.00      $0     $6,536    $783      0.00      1.83
                                           $0     $7,319

0208401000  REMOVE INSULATION FROM PIPE FITTING, UP TO 4"
DIAMETER PIPE
Unit values      0.20      0.00      4.60      0.56      500.00 Ea.
Totals          100.00      $0     $2,298    $281      0.00      5.16
                                           $0     $2,579

0222540060  EXCAV TRENCH, COMMON EARTH, 1'-4' DEEP, 1/2
CY TRAC/LDR/B'HOE
Unit values      0.08      0.00      1.47      1.17      25.00 C.Y.
Totals           2.00      $0      $37      $29      0.00      2.64
                                           $0      $66

0222541900  TAMPING TRENCH B'FILL, VIBRATING PLATE, ADD
Unit values      0.09      0.00      1.44      0.55      25.00 C.Y.
Totals           2.23      $0      $36      $14      0.00      1.99
                                           $0      $50

0222543020  BACKFILL TRENCH, F.E. LOADER, WHEEL MTD., 1CY
BUCKET, MIN HAUL
Unit values      0.03      0.00      0.58      0.48      25.00 C.Y.
Totals           0.75      $0      $14      $12      0.00      1.06
                                           $0      $26

0251040380  ASPHALTIC CONCRETE PAVEMENT, PAVING, WEARING
COURSE, 2" THICK
Unit values      0.02      2.96      0.27      0.25      40.00 S.Y.
Totals           0.60     $118      $11      $10      0.00      3.48
                                           $0     $139

```

```
=====
Line #      Description
-----
      Manhours  Matl    Labor  Equipment  Sub    Total
=====
U02 SITEWORK      1023      $118   $20,081   $5,484      $0   $25,683
0331305010      6" THICK SLAB FOR NEW TRANSFORMER
Unit values      0.02      1.45      0.28      0.00      48.00 S.F.  1.73
Totals           1.15      $70      $13      $0      $0      $83
U03 CONCRETE      2      $70      $13      $0      $0      $83
```

=====						
Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1554512050	HTG INFRA RED ELEC 6KW 20478BTU					
					7.00 Ea.	
Unit values	2.67	334.67	44.47	0.00	0.00	379.13
Totals	18.67	\$2,343	\$311	\$0	\$0	\$2,654
1554512100	HTG INFRA RED ELEC 13.5KW 46075.5BTU					
					7.00 Ea.	
Unit values	3.20	455.20	53.24	0.00	0.00	508.44
Totals	22.40	\$3,186	\$373	\$0	\$0	\$3,559
1554512150	HTG INFRA RED ELEC 27KW 92151BTU					
					33.00 Ea.	
Unit values	4.00	879.31	66.55	0.00	0.00	945.86
Totals	132.00	\$29,017	\$2,196	\$0	\$0	\$31,213
1574205220	ELECTRIC THERMOSTAT W/ COVER AND WIRING					
					40.00 Ea.	
Unit values	1.00	74.93	20.81	0.00	0.00	95.74
Totals	40.00	\$2,997	\$832	\$0	\$0	\$3,829
U15 MECHANICAL	214	\$37,543	\$3,712	\$0	\$0	\$41,255

Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1611400600	MINERAL INSULATED CABLE 600V 1 #4					
					3.00 C.L.F.	
Unit values	6.67	402.81	103.21	0.00	0.00	506.02
Totals	20.00	\$1,208	\$310	\$0	\$0	\$1,518
1611400800	MINERAL INSULATED CABLE 600V 1 #2					
					6.00 C.L.F.	
Unit values	7.27	537.08	112.80	0.00	0.00	649.88
Totals	43.64	\$3,222	\$677	\$0	\$0	\$3,899
1621100220	OUTLET BOXES STEEL, 4" SQ, 2-1/8" DEEP, 1" K.O.'S					
					40.00 Ea.	
Unit values	0.40	2.36	6.20	0.00	0.00	8.57
Totals	16.00	\$94	\$248	\$0	\$0	\$342
1621100250	OUTLET BOX STEEL 4" COVERS BLANK					
					40.00 Ea.	
Unit values	0.13	0.54	1.94	0.00	0.00	2.48
Totals	5.00	\$21	\$78	\$0	\$0	\$99
1631200100	HEATING SYSTEM POWER / CONTROL PANEL					
					10.00 Ea.	
Unit values	2.96	320.72	45.97	0.00	0.00	366.69
Totals	29.63	\$3,207	\$460	\$0	\$0	\$3,667
1641600500	TRANSFORMER OIL PAD 15KV 480V 3P1000KVA					
					1.00 Ea.	
Unit values	76.92	17408.80	1184.40	225.60	0.00	18818.80
Totals	76.92	\$17,409	\$1,184	\$226	\$0	\$18,819
1671104800	UNDERGROUND DUCT BANK PVC TYPE EB 4 - 2" DIA					
					250.00 L.F.	
Unit values	0.13	1.48	2.07	0.00	0.00	3.55
Totals	33.25	\$370	\$517	\$0	\$0	\$887
U16 ELECTRICAL	225	\$25,531	\$3,474	\$226	\$0	\$29,231

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=====
Line #      Description
-----
              Manhours   Matl      Labor    Equipment    Sub      Total
=====
```

ESTIMATE TOTAL	2897	\$114,563	\$58,694	\$5,710	\$0	\$178,967
SALES TAX	0.00%	\$0				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$114,563	\$58,694	\$5,710	\$0	\$178,967
CONTINGENCY	10.00%					\$17,897
BOND	0.00%					\$0
PROFIT	10.00%					\$17,897
JOB TOTAL						\$214,760

```

=====
Estimate:      BLDG 3807      Date:      28-Nov-94
Description:   ELECTRIC INFRARED HEATING SYSTEM COST ESTIMATE
Project:      LIMITED EEAP(HGR) Bid Date:
Location:     FORT BRAGG,N.C  Job #:      94013.04
Sq. footage:  31586         City indx:Raleigh, NC
=====

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SUMMARY

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-----
Manhours  Matl    Labor  Equipment  Sub    Total
=====
A09 ELECTRICAL  1433  $51,301  $31,414      $0      $0  $82,715
U02 SITEWORK    1023    $118    $20,081    $5,484    $0  $25,683
U03 CONCRETE      2      $70      $13        $0      $0   $83
U15 MECHANICAL   214   $37,543  $3,712      $0      $0  $41,255
U16 ELECTRICAL   225   $25,531  $3,474    $226      $0  $29,231

TOTAL          2897  $114,563  $58,694    $5,710    $0  $178,967

SALES TAX      0.00%      $0
MATL MARKUP    0.00%      $0
LABOR MARKUP   0.00%      $0
EQUIPT MARKUP  0.00%      $0
SUB MARKUP     0.00%      $0

TOTAL BEFORE CONTINGENC $114,563  $58,694  $5,710    $0  $178,967
CONTINGENCY      10.00%      $17,897
BOND              0.00%      $0
PROFIT           10.00%      $17,897

JOB TOTAL                                $214,760

```


LIFE CYCLE COST ANALYSIS SUMMARY

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) STUDY: 3954ECO3
 INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3
 PROJECT NO. & TITLE: 94013.04 LES: ECO3 - ELECTRIC INFRARED HEAT
 FISCAL YEAR 95 DISCRETE PORTION NAME: ECO
 ANALYSIS DATE: 12-05-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	105584.	
B. SIOH	\$	5279.	
C. DESIGN COST	\$	5279.	
D. TOTAL COST (1A+1B+1C)	\$	116142.	
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.	
F. PUBLIC UTILITY COMPANY REBATE	\$	0.	
G. TOTAL INVESTMENT (1D - 1E - 1F)			\$ 116142.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	-115.	\$ -4002.	15.08	\$ -60357.
B. DIST	\$ 19.18	900.	\$ 17258.	18.57	\$ 320484.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	0.	\$ 0.	18.58	\$ 0.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ -24975.	14.88	\$ -371628.
N. TOTAL		785.	\$ -11719.		\$ -111501.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$ 3081.
(1) DISCOUNT FACTOR (TABLE A)	14.88	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$ 45848.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+) COST(-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-) (3A2+3Bd4) \$ 45848.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ -8638.

5. SIMPLE PAYBACK PERIOD (1G/4) -13.45 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ -65653.

7. SAVINGS TO INVESTMENT RATIO (SIR) = (6 / 1G) = -.57
 (IF < 1 PROJECT DOES NOT QUALIFY)

**** Project does not qualify for ECIP funding; 4,5,6 for information only.

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): N/A

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=====
Estimate:      BLDG 3954      Date:      28-Nov-94
Description:    ELECTRIC INFRARED HEATING SYSTEM COST ESTIMATE
Project:       LIMITED EEAP (HGR) Bid Date:
Location:      FORT BRAGG, N.C Job #:      94013.04
Sq. footage:   19500        City indx: Raleigh, NC
=====

```

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0913100280	FEEDER INSTALLATION, INCLUDING CONDUIT AND WIRE, 200 AMPERES					2000.00 L.F.	
Unit values		0.31	9.45	6.71	0.00	0.00	16.16
Totals		612.00	\$18,890	\$13,423	\$0	\$0	\$32,313
0914100200	SWITCHGEAR INST, INCL SWBD, PANELS & CIRC BKR, 400 AMPS					1.00 EACH	
Unit values		50.36	2731.70	1099.80	0.00	0.00	3831.50
Totals		50.36	\$2,732	\$1,100	\$0	\$0	\$3,832
A09 ELECTRICAL		663	\$21,622	\$14,523	\$0	\$0	\$36,145

```

=====
Line #      Description
-----
Manhours    Matl      Labor    Equipment    Sub      Total
=====

0205541750  PAVEMENT REMOVAL, BITUMINOUS, 4" TO 6" THICK
                                     30.00 S.Y.
Unit values    0.10      0.00      1.73      2.50      0.00      4.23
Totals         2.85      $0        $52       $75       $0        $127

0205543200  SITE REMOVAL, STEEL PIPE, WELDED CONNECTION,
4" DIAMETER                                     1600.00 L.F.
Unit values    0.15      0.00      2.61      1.06      0.00      3.68
Totals        240.00      $0      $4,180    $1,702     $0      $5,882

0207183600  HVAC DEMO, MECH EQPT HEAVY ITEM
                                     1.50 Ton
Unit values    14.55      0.00     314.87      0.00      0.00     314.87
Totals        21.82      $0      $472       $0       $0      $472

0208400600  REMOVE PIPE INSULATION UP TO 4" DIAMETER PIPE
                                     1400.00 L.F.
Unit values    0.07      0.00      1.63      0.20      0.00      1.83
Totals        99.40      $0     $2,287    $274       $0     $2,561

0208401000  REMOVE INSULATION FROM PIPE FITTING, UP TO 4"
DIAMETER PIPE                                     160.00 Ea.
Unit values    0.20      0.00      4.60      0.56      0.00      5.16
Totals        32.00      $0      $735      $90       $0      $825

0222540060  EXCAV TRENCH, COMMON EARTH, 1'-4' DEEP, 1/2
CY TRAC/LDR/B'HOE                                     15.00 C.Y.
Unit values    0.08      0.00      1.47      1.17      0.00      2.64
Totals        1.20      $0      $22       $17       $0      $39

0222541900  TAMPING TRENCH B'FILL, VIBRATING PLATE, ADD
                                     15.00 C.Y.
Unit values    0.09      0.00      1.44      0.55      0.00      1.99
Totals        1.34      $0      $22       $8       $0      $30

0222543020  BACKFILL TRENCH, F.E. LOADER, WHEEL MTD., 1CY
BUCKET, MIN HAUL                                     15.00 C.Y.
Unit values    0.03      0.00      0.58      0.48      0.00      1.06
Totals        0.45      $0      $9        $7       $0      $16

0251040380  ASPHALTIC CONCRETE PAVEMENT, PAVING, WEARING
COURSE, 2" THICK                                     30.00 S.Y.
Unit values    0.02      2.96      0.27      0.25      0.00      3.48
Totals        0.45      $89      $8        $7       $0      $104

```

```
=====
Line #      Description
-----
      Manhours  Matl    Labor  Equipment  Sub    Total
=====
U02 SITEWORK      400      $89    $7,787    $2,180      $0    $10,056
0331305010      6" THICK SLAB FOR NEW TRANSFORMER
Unit values      0.02      1.45      0.28      0.00      48.00 S.F.  1.73
Totals            1.15      $70      $13      $0      $0      $83
U03 CONCRETE      2      $70      $13      $0      $0      $83
```

```
=====
Line #      Description
-----
              Manhours  Matl    Labor  Equipment  Sub      Total
=====
```

1554512150 HTG INFRA RED ELEC 27KW 92151BTU

					20.00 Ea.	
Unit values	4.00	879.31	66.55	0.00	0.00	945.86
Totals	80.00	\$17,586	\$1,331	\$0	\$0	\$18,917

1574205220 ELECTRIC THERMOSTAT W/ COVER AND WIRING

					20.00 Ea.	
Unit values	1.00	74.93	20.81	0.00	0.00	95.74
Totals	20.00	\$1,499	\$416	\$0	\$0	\$1,915

U15 MECHANICAL 100 \$19,085 \$1,747 \$0 \$0 \$20,832

=====						
Line #	Description					

	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1611400600	MINERAL INSULATED CABLE 600V 1 #4				2.50 C.L.F.	
Unit values	6.67	402.81	103.21	0.00	0.00	506.02
Totals	16.67	\$1,007	\$258	\$0	\$0	\$1,265
1611400800	MINERAL INSULATED CABLE 600V 1 #2				5.00 C.L.F.	
Unit values	7.27	537.08	112.80	0.00	0.00	649.88
Totals	36.37	\$2,685	\$564	\$0	\$0	\$3,249
1621100220	OUTLET BOXES STEEL, 4" SQ, 2-1/8" DEEP, 1" K.O.'S				20.00 Ea.	
Unit values	0.40	2.36	6.20	0.00	0.00	8.57
Totals	8.00	\$47	\$124	\$0	\$0	\$171
1621100250	OUTLET BOX STEEL 4" COVERS BLANK				20.00 Ea.	
Unit values	0.13	0.54	1.94	0.00	0.00	2.48
Totals	2.50	\$11	\$39	\$0	\$0	\$50
1631200100	HEATING SYSTEM POWER / CONTROL PANEL				7.00 Ea.	
Unit values	2.96	320.72	45.97	0.00	0.00	366.69
Totals	20.74	\$2,245	\$322	\$0	\$0	\$2,567
1641600300	TRANSFORMER OIL PAD 15KV 480V 3P500KVA				1.00 Ea.	
Unit values	50.00	11760.20	775.50	146.08	0.00	12681.78
Totals	50.00	\$11,760	\$776	\$146	\$0	\$12,682
1671104800	UNDERGROUND DUCT BANK PVC TYPE EB 4 - 2" DIA				250.00 L.F.	
Unit values	0.13	1.48	2.07	0.00	0.00	3.55
Totals	33.25	\$370	\$517	\$0	\$0	\$887
U16 ELECTRICAL	168	\$18,125	\$2,600	\$146	\$0	\$20,871

```
=====
Line #      Description
-----
      Manhours   Matl    Labor   Equipment   Sub    Total
=====
```

ESTIMATE TOTAL	1333	\$58,991	\$26,670	\$2,326	\$0	\$87,987
SALES TAX	0.00%	\$0				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$58,991	\$26,670	\$2,326	\$0	\$87,987
CONTINGENCY	10.00%					\$8,799
BOND	0.00%					\$0
PROFIT	10.00%					\$8,799
JOB TOTAL						\$105,584

```

=====
Estimate:      BLDG 3954      Date:      28-Nov-94
Description:   ELECTRIC INFRARED HEATING SYSTEM COST ESTIMATE
Project:      LIMITED EEAP(HGR) Bid Date:
Location:     FORT BRAGG,N.C  Job #:      94013.04
Sq. footage:  19500          City indx:Raleigh, NC
=====

```

SUMMARY

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-----
Manhours  Matl    Labor  Equipment  Sub    Total
=====
A09 ELECTRICAL      663    $21,622    $14,523          $0    $36,145
U02 SITEWORK        400         $89     $7,787    $2,180          $0    $10,056
U03 CONCRETE         2         $70         $13          $0         $83
U15 MECHANICAL     100    $19,085     $1,747          $0    $20,832
U16 ELECTRICAL     168    $18,125     $2,600     $146          $0    $20,871

TOTAL              1333    $58,991    $26,670    $2,326          $0    $87,987

SALES TAX           0.00%         $0
MATL MARKUP         0.00%         $0
LABOR MARKUP        0.00%          $0
EQUIPT MARKUP       0.00%          $0
SUB MARKUP          0.00%          $0

TOTAL BEFORE CONTINGENC $58,991    $26,670    $2,326          $0    $87,987
CONTINGENCY         10.00%          $8,799
BOND                 0.00%          $0
PROFIT              10.00%          $8,799

JOB TOTAL                                     $105,584

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LIFE CYCLE COST ANALYSIS SUMMARY
 ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) STUDY: 3962ECO3
 INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 LCCID FY95 (92)
 PROJECT NO. & TITLE: 94013.04 LES: ECO3 - ELECTRIC INFRARED HEAT
 FISCAL YEAR 95 DISCRETE PORTION NAME: ECO
 ANALYSIS DATE: 12-13-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	144029.		
B. SIOH	\$	7201.		
C. DESIGN COST	\$	7201.		
D. TOTAL COST (1A+1B+1C)	\$	158431.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.		
F. PUBLIC UTILITY COMPANY REBATE	\$	0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)			\$	158431.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	-178.	\$ -6206.	15.08	\$ -93582.
B. DIST	\$ 19.18	953.	\$ 18286.	18.57	\$ 339575.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	0.	\$ 0.	18.58	\$ 0.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ -29484.	14.88	\$ -438722.
N. TOTAL		776.	\$ -17404.		\$ -192729.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$	4950.
(1) DISCOUNT FACTOR (TABLE A)		14.88	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$	73660.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-) (4)
d. TOTAL	\$	0.		0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-) (3A2+3Bd4) \$ 73660.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS\ ECONOMIC\ LIFE))$ \$ -12453.

5. SIMPLE PAYBACK PERIOD (1G/4) -12.72 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ -119069.

7. SAVINGS TO INVESTMENT RATIO (SIR)=(6 / 1G)= -.75
 (IF < 1 PROJECT DOES NOT QUALIFY)

**** Project does not qualify for ECIP funding; 4,5,6 for information only.

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): N/A

```

=====
Estimate:      BLDG 3962      Date:      28-Nov-94
Description:    ELECTRIC INFRARED HEATING SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG,N.C Job #:      94013.04
Sq. footage:   19500        City indx:Raleigh, NC
=====

```

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0913100280	FEEDER INSTALLATION, INCLUDING CONDUIT AND WIRE, 200 AMPERES					3000.00 L.F.	
Unit values		0.31	9.45	6.71	0.00	0.00	16.16
Totals		918.00	\$28,336	\$20,135	\$0	\$0	\$48,471
0914100240	SWITCHGEAR INST, INCL SWBD, PANELS & CIRC BKR, 600 AMPERES					1.00 EACH	
Unit values		68.07	6574.60	1494.60	0.00	0.00	8069.20
Totals		68.07	\$6,575	\$1,495	\$0	\$0	\$8,070
A09 ELECTRICAL		987	\$34,911	\$21,630	\$0	\$0	\$56,541

=====						
Line #	Description					

	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
0205541750	PAVEMENT REMOVAL, BITUMINOUS, 4" TO 6" THICK					
					30.00 S.Y.	
Unit values	0.10	0.00	1.73	2.50	0.00	4.23
Totals	2.85	\$0	\$52	\$75	\$0	\$127
0205543200	SITE REMOVAL, STEEL PIPE, WELDED CONNECTION, 4" DIAMETER					
					1600.00 L.F.	
Unit values	0.15	0.00	2.61	1.06	0.00	3.68
Totals	240.00	\$0	\$4,180	\$1,702	\$0	\$5,882
0207183600	HVAC DEMO, MECH EQPT HEAVY ITEM					
					1.50 Ton	
Unit values	14.55	0.00	314.87	0.00	0.00	314.87
Totals	21.82	\$0	\$472	\$0	\$0	\$472
0208400600	REMOVE PIPE INSULATION UP TO 4" DIAMETER PIPE					
					1400.00 L.F.	
Unit values	0.07	0.00	1.63	0.20	0.00	1.83
Totals	99.40	\$0	\$2,287	\$274	\$0	\$2,561
0208401000	REMOVE INSULATION FROM PIPE FITTING, UP TO 4" DIAMETER PIPE					
					160.00 Ea.	
Unit values	0.20	0.00	4.60	0.56	0.00	5.16
Totals	32.00	\$0	\$735	\$90	\$0	\$825
0222540060	EXCAV TRENCH, COMMON EARTH, 1'-4' DEEP, 1/2 CY TRAC/LDR/B'HOE					
					15.00 C.Y.	
Unit values	0.08	0.00	1.47	1.17	0.00	2.64
Totals	1.20	\$0	\$22	\$17	\$0	\$39
0222541900	TAMPING TRENCH B'FILL, VIBRATING PLATE, ADD					
					15.00 C.Y.	
Unit values	0.09	0.00	1.44	0.55	0.00	1.99
Totals	1.34	\$0	\$22	\$8	\$0	\$30
0222543020	BACKFILL TRENCH, F.E.LOADER, WHEEL MTD., 1CY BUCKET, MIN HAUL					
					15.00 C.Y.	
Unit values	0.03	0.00	0.58	0.48	0.00	1.06
Totals	0.45	\$0	\$9	\$7	\$0	\$16
0251040380	ASPHALTIC CONCRETE PAVEMENT, PAVING, WEARING COURSE, 2" THICK					
					30.00 S.Y.	
Unit values	0.02	2.96	0.27	0.25	0.00	3.48
Totals	0.45	\$89	\$8	\$7	\$0	\$104

```
=====
Line #      Description
-----
      Manhours   Matl     Labor   Equipment   Sub     Total
=====
U02 SITEWORK      400       $89    $7,787    $2,180       $0    $10,056
0331305010      6" THICK SLAB FOR NEW TRANSFORMER
Unit values      0.02       1.45     0.28     0.00      48.00 S.F.  1.73
Totals           1.15       $70     $13      $0        0.00      $83
U03 CONCRETE       2       $70     $13      $0        $0        $83
=====
```

=====						
Line #	Description					

	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1554512050	HTG INFRA RED ELEC 6KW 20478BTU					
					5.00 Ea.	
Unit values	2.67	334.67	44.47	0.00	0.00	379.13
Totals	13.34	\$1,673	\$222	\$0	\$0	\$1,895
1554512100	HTG INFRA RED ELEC 13.5KW 46075.5BTU					
					5.00 Ea.	
Unit values	3.20	455.20	53.24	0.00	0.00	508.44
Totals	16.00	\$2,276	\$266	\$0	\$0	\$2,542
1554512150	HTG INFRA RED ELEC 27KW 92151BTU					
					20.00 Ea.	
Unit values	4.00	879.31	66.55	0.00	0.00	945.86
Totals	80.00	\$17,586	\$1,331	\$0	\$0	\$18,917
1574205220	ELECTRIC THERMOSTAT W/ COVER AND WIRING					
					30.00 Ea.	
Unit values	1.00	74.93	20.81	0.00	0.00	95.74
Totals	30.00	\$2,248	\$624	\$0	\$0	\$2,872
U15 MECHANICAL	140	\$23,783	\$2,443	\$0	\$0	\$26,226

Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1611400600	MINERAL INSULATED CABLE 600V 1 #4					
					2.50 C.L.F.	
Unit values	6.67	402.81	103.21	0.00	0.00	506.02
Totals	16.67	\$1,007	\$258	\$0	\$0	\$1,265
1611400800	MINERAL INSULATED CABLE 600V 1 #2					
					5.00 C.L.F.	
Unit values	7.27	537.08	112.80	0.00	0.00	649.88
Totals	36.37	\$2,685	\$564	\$0	\$0	\$3,249
1621100220	OUTLET BOXES STEEL, 4" SQ, 2-1/8" DEEP, 1" K.O.'S					
					30.00 Ea.	
Unit values	0.40	2.36	6.20	0.00	0.00	8.57
Totals	12.00	\$71	\$186	\$0	\$0	\$257
1621100250	OUTLET BOX STEEL 4" COVERS BLANK					
					30.00 Ea.	
Unit values	0.13	0.54	1.94	0.00	0.00	2.48
Totals	3.75	\$16	\$58	\$0	\$0	\$74
1631200100	HEATING SYSTEM POWER / CONTROL PANEL					
					7.00 Ea.	
Unit values	2.96	320.72	45.97	0.00	0.00	366.69
Totals	20.74	\$2,245	\$322	\$0	\$0	\$2,567
1641600500	TRANSFORMER OIL PAD 15KV 480V 3P1000KVA					
					1.00 Ea.	
Unit values	76.92	17408.80	1184.40	225.60	0.00	18818.80
Totals	76.92	\$17,409	\$1,184	\$226	\$0	\$18,819
1671104800	UNDERGROUND DUCT BANK PVC TYPE EB 4 - 2" DIA					
					250.00 L.F.	
Unit values	0.13	1.48	2.07	0.00	0.00	3.55
Totals	33.25	\$370	\$517	\$0	\$0	\$887
U16 ELECTRICAL	200	\$23,803	\$3,089	\$226	\$0	\$27,118

```
=====
Line #      Description
-----
           Manhours   Matl     Labor   Equipment   Sub     Total
=====

ESTIMATE TOTAL      1729    $82,656    $34,962    $2,406           $0    $120,024

SALES TAX            0.00%           $0
MATL MARKUP          0.00%           $0
LABOR MARKUP         0.00%           $0
EQUIPT MARKUP        0.00%           $0
SUB MARKUP           0.00%           $0

TOTAL BEFORE CONTINGENC $82,656    $34,962    $2,406           $0    $120,024
CONTINGENCY           10.00%           $12,002
BOND                   0.00%           $0
PROFIT                 10.00%           $12,002

JOB TOTAL                                     $144,029
```

```

=====
Estimate:      BLDG 3962      Date:      28-Nov-94
Description:    ELECTRIC INFRARED HEATING SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG,N.C Job #:      94013.04
Sq. footage:   19500        City indx:Raleigh, NC
=====

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SUMMARY

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-----
Manhours  Matl  Labor  Equipment  Sub  Total
=====
A09 ELECTRICAL  987  $34,911  $21,630  $0  $0  $56,541
U02 SITEWORK    400  $89  $7,787  $2,180  $0  $10,056
U03 CONCRETE     2  $70  $13  $0  $0  $83
U15 MECHANICAL  140  $23,783  $2,443  $0  $0  $26,226
U16 ELECTRICAL  200  $23,803  $3,089  $226  $0  $27,118

TOTAL          1729  $82,656  $34,962  $2,406  $0  $120,024

SALES TAX      0.00%  $0
MATL MARKUP    0.00%  $0
LABOR MARKUP   0.00%  $0
EQUIPT MARKUP  0.00%  $0
SUB MARKUP     0.00%  $0

TOTAL BEFORE CONTINGENC  $82,656  $34,962  $2,406  $0  $120,024
CONTINGENCY      10.00%  $12,002
BOND              0.00%  $0
PROFIT           10.00%  $12,002

JOB TOTAL                                     $144,029

```


LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 4137ECO3
LCCID FY95 (92)

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 94013.04 LES: ECO3 - ELECTRIC INFRARED HEAT

FISCAL YEAR 95 DISCRETE PORTION NAME: ECO

ANALYSIS DATE: 12-05-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	91571.		
B. SIOH	\$	4579.		
C. DESIGN COST	\$	4579.		
D. TOTAL COST (1A+1B+1C)	\$	100729.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.		
F. PUBLIC UTILITY COMPANY REBATE	\$	0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)			\$	100729.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	-128.	\$ -4461.	15.08	\$ -67277.
B. DIST	\$ 19.18	820.	\$ 15725.	18.57	\$ 292022.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	0.	\$ 0.	18.58	\$ 0.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ -19494.	14.88	\$ -290071.
N. TOTAL		692.	\$ -8230.		\$ -65326.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)

(1) DISCOUNT FACTOR (TABLE A)	14.88	\$	1539.
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$	22899.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-) (3A2+3Bd4)\$ 22899.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ -6691.

5. SIMPLE PAYBACK PERIOD (1G/4) -15.05 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ -42427.

7. SAVINGS TO INVESTMENT RATIO (SIR)=(6 / 1G)= -.42
(IF < 1 PROJECT DOES NOT QUALIFY)

**** Project does not qualify for ECIP funding; 4,5,6 for information only.

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): N/A

```

=====
Estimate:      BLDG  4137      Date:      28-Nov-94
Description:    ELECTRIC INFRARED HEATING SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG,N.C  Job #:      94013.04
Sq. footage:   12000          City indx:Raleigh, NC
=====

```

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0913100280	FEEDER INSTALLATION, INCLUDING CONDUIT AND WIRE, 200 AMPERES					1800.00 L.F.	
Unit values		0.31	9.45	6.71	0.00	0.00	16.16
Totals		550.80	\$17,001	\$12,081	\$0	\$0	\$29,082
0914100200	SWITCHGEAR INST, INCL SWBD, PANELS & CIRC BKR, 400 AMPS					1.00 EACH	
Unit values		50.36	2731.70	1099.80	0.00	0.00	3831.50
Totals		50.36	\$2,732	\$1,100	\$0	\$0	\$3,832
A09 ELECTRICAL		602	\$19,733	\$13,181	\$0	\$0	\$32,914

=====						
Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
0205541750	PAVEMENT REMOVAL, BITUMINOUS, 4" TO 6" THICK					
					20.00 S.Y.	
Unit values	0.10	0.00	1.73	2.50	0.00	4.23
Totals	1.90	\$0	\$35	\$50	\$0	\$85
0205543200	SITE REMOVAL, STEEL PIPE, WELDED CONNECTION, 4" DIAMETER					
					1000.00 L.F.	
Unit values	0.15	0.00	2.61	1.06	0.00	3.68
Totals	150.00	\$0	\$2,613	\$1,064	\$0	\$3,677
0207183600	HVAC DEMO, MECH EQPT HEAVY ITEM					
					1.00 Ton	
Unit values	14.55	0.00	314.87	0.00	0.00	314.87
Totals	14.55	\$0	\$315	\$0	\$0	\$315
0208400600	REMOVE PIPE INSULATION UP TO 4" DIAMETER PIPE					
					1000.00 L.F.	
Unit values	0.07	0.00	1.63	0.20	0.00	1.83
Totals	71.00	\$0	\$1,634	\$196	\$0	\$1,830
0208401000	REMOVE INSULATION FROM PIPE FITTING, UP TO 4" DIAMETER PIPE					
					125.00 Ea.	
Unit values	0.20	0.00	4.60	0.56	0.00	5.16
Totals	25.00	\$0	\$574	\$70	\$0	\$644
0222540060	EXCAV TRENCH, COMMON EARTH, 1'-4' DEEP, 1/2 CY TRAC/LDR/B'HOE					
					15.00 C.Y.	
Unit values	0.08	0.00	1.47	1.17	0.00	2.64
Totals	1.20	\$0	\$22	\$17	\$0	\$39
0222541900	TAMPING TRENCH B'FILL, VIBRATING PLATE, ADD					
					15.00 C.Y.	
Unit values	0.09	0.00	1.44	0.55	0.00	1.99
Totals	1.34	\$0	\$22	\$8	\$0	\$30
0222543020	BACKFILL TRENCH, F.E. LOADER, WHEEL MTD., 1 CY BUCKET, MIN HAUL					
					15.00 C.Y.	
Unit values	0.03	0.00	0.58	0.48	0.00	1.06
Totals	0.45	\$0	\$9	\$7	\$0	\$16
0251040380	ASPHALTIC CONCRETE PAVEMENT, PAVING, WEARING COURSE, 2" THICK					
					20.00 S.Y.	
Unit values	0.02	2.96	0.27	0.25	0.00	3.48
Totals	0.30	\$59	\$5	\$5	\$0	\$69

```
=====
Line #      Description
-----
            Manhours  Matl    Labor  Equipment  Sub    Total
=====
U02 SITEWORK      266      $59    $5,229    $1,417      $0    $6,705
0331305010      6" THICK SLAB FOR NEW TRANSFORMER
Unit values      0.02      1.45    0.28      0.00      48.00 S.F.  1.73
Totals            1.15      $70     $13      $0          $0    $83

U03 CONCRETE       2      $70     $13      $0          $0    $83
```

```

=====
Line #      Description
-----
              Manhours  Matl    Labor  Equipment  Sub      Total
=====

1554512050   HTG INFRA RED ELEC 6KW 20478BTU
Unit values      2.67    334.67    44.47    0.00      5.00 Ea.
Totals          13.34    $1,673    $222     $0      0.00    379.13
                                           $0      $1,895

1554512100   HTG INFRA RED ELEC 13.5KW 46075.5BTU
Unit values      3.20    455.20    53.24    0.00      5.00 Ea.
Totals          16.00    $2,276    $266     $0      0.00    508.44
                                           $0      $2,542

1554512150   HTG INFRA RED ELEC 27KW 92151BTU
Unit values      4.00    879.31    66.55    0.00     12.00 Ea.
Totals          48.00   $10,552    $799     $0      0.00    945.86
                                           $0      $11,351

1574205220   ELECTRIC THERMOSTAT W/ COVER AND WIRING
Unit values      1.00     74.93    20.81    0.00     22.00 Ea.
Totals          22.00    $1,648    $458     $0      0.00     95.74
                                           $0      $2,106

U15 MECHANICAL    100    $16,149    $1,745     $0      $0      $17,894

```

=====						
Line #	Description					

	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1611400600	MINERAL INSULATED CABLE 600V 1 #4					
					2.00 C.L.F.	
Unit values	6.67	402.81	103.21	0.00	0.00	506.02
Totals	13.33	\$806	\$206	\$0	\$0	\$1,012
1611400800	MINERAL INSULATED CABLE 600V 1 #2					
					4.00 C.L.F.	
Unit values	7.27	537.08	112.80	0.00	0.00	649.88
Totals	29.09	\$2,148	\$451	\$0	\$0	\$2,599
1621100220	OUTLET BOXES STEEL, 4" SQ, 2-1/8" DEEP, 1" K.O.'S					
					22.00 Ea.	
Unit values	0.40	2.36	6.20	0.00	0.00	8.57
Totals	8.80	\$52	\$136	\$0	\$0	\$188
1621100250	OUTLET BOX STEEL 4" COVERS BLANK					
					22.00 Ea.	
Unit values	0.13	0.54	1.94	0.00	0.00	2.48
Totals	2.75	\$12	\$43	\$0	\$0	\$55
1631200100	HEATING SYSTEM POWER / CONTROL PANEL					
					4.00 Ea.	
Unit values	2.96	320.72	45.97	0.00	0.00	366.69
Totals	11.85	\$1,283	\$184	\$0	\$0	\$1,467
1641600300	TRANSFORMER OIL PAD 15KV 480V 3P500KVA					
					1.00 Ea.	
Unit values	50.00	11760.20	775.50	146.08	0.00	12681.78
Totals	50.00	\$11,760	\$776	\$146	\$0	\$12,682
1671104800	UNDERGROUND DUCT BANK PVC TYPE EB 4 - 2" DIA					
					200.00 L.F.	
Unit values	0.13	1.48	2.07	0.00	0.00	3.55
Totals	26.60	\$296	\$414	\$0	\$0	\$710
U16 ELECTRICAL	143	\$16,357	\$2,210	\$146	\$0	\$18,713

```
=====
Line #      Description
-----
      Manhours   Matl     Labor   Equipment   Sub     Total
=====

ESTIMATE TOTAL      1113    $52,368    $22,378    $1,563          $0    $76,309

SALES TAX            0.00%          $0
MATL MARKUP          0.00%          $0
LABOR MARKUP         0.00%          $0
EQUIPT MARKUP        0.00%          $0
SUB MARKUP           0.00%          $0

TOTAL BEFORE CONTINGENC  $52,368    $22,378    $1,563          $0    $76,309
CONTINGENCY          10.00%          $7,631
BOND                  0.00%          $0
PROFIT               10.00%          $7,631

JOB TOTAL                                $91,571
```

```

=====
Estimate:      BLDG  4137      Date:      28-Nov-94
Description:    ELECTRIC INFRARED HEATING SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG,N.C  Job #:      94013.04
Sq. footage:   12000          City indx:Raleigh, NC
=====

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SUMMARY

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-----
Manhours  Matl    Labor   Equipment   Sub    Total
=====
A09 ELECTRICAL      602    $19,733    $13,181        $0    $32,914
U02 SITEWORK        266         $59    $5,229    $1,417        $0    $6,705
U03 CONCRETE         2         $70     $13        $0        $0     $83
U15 MECHANICAL     100    $16,149    $1,745        $0    $17,894
U16 ELECTRICAL     143    $16,357    $2,210    $146        $0    $18,713

TOTAL              1113    $52,368    $22,378    $1,563        $0    $76,309

SALES TAX           0.00%         $0
MATL MARKUP         0.00%         $0
LABOR MARKUP        0.00%          $0
EQUIPT MARKUP       0.00%          $0
SUB MARKUP          0.00%          $0

TOTAL BEFORE CONTINGENC $52,368    $22,378    $1,563        $0    $76,309
CONTINGENCY          10.00%          $0
BOND                 0.00%          $0
PROFIT               10.00%          $0

JOB TOTAL                                $91,571

```


LIFE CYCLE COST ANALYSIS SUMMARY

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) STUDY: 4242ECO3
 INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 LCCID FY95 (92)
 PROJECT NO. & TITLE: 94013.04 LES: ECO3 - ELECTRIC INFRARED HEAT
 FISCAL YEAR 95 DISCRETE PORTION NAME: ECO
 ANALYSIS DATE: 12-05-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	58682.	
B. SIOH	\$	2934.	
C. DESIGN COST	\$	2934.	
D. TOTAL COST (1A+1B+1C)	\$	64550.	
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.	
F. PUBLIC UTILITY COMPANY REBATE	\$	0.	
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$		64550.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH (1)	SAVINGS MWH/YR (2)	ANNUAL \$ SAVINGS (3)	DISCOUNT FACTOR (4)	DISCOUNTED SAVINGS (5)
A. ELECT	\$ 34.95	-55.	\$ -1919.	15.08	\$ -28940.
B. DIST	\$ 19.18	563.	\$ 10806.	18.57	\$ 200675.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	0.	\$ 0.	18.58	\$ 0.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ -8741.	14.88	\$ -130066.
N. TOTAL		509.	\$ 146.		\$ 41669.

3. NON ENERGY SAVINGS (+) / COST (-)

A. ANNUAL RECURRING (+/-)

(1) DISCOUNT FACTOR (TABLE A)	14.88	\$ 3621.
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$ 53876.

B. NON RECURRING SAVINGS (+) / COSTS (-)

ITEM	SAVINGS (+) COST (-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS (+) / COST (-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS (+) / COST (-) (3A2+3Bd4) \$ 53876.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ 3767.

5. SIMPLE PAYBACK PERIOD (1G/4) 17.14 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 95544.

7. SAVINGS TO INVESTMENT RATIO (SIR) = $(6 / 1G) =$ 1.48
 (IF < 1 PROJECT DOES NOT QUALIFY)

**** Project does not qualify for ECIP funding; 4,5,6 for information only.

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): N/A

```

=====
Estimate:      BLDG 4242      Date:      28-Nov-94
Description:    ELECTRIC INFRARED HEATING SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG,N.C Job #:      94013.04
Sq. footage:   6000          City indx:Raleigh, NC
=====

```

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0913100280	FEEDER INSTALLATION, INCLUDING CONDUIT AND WIRE, 200 AMPERES					1000.00 L.F.	
Unit values		0.31	9.45	6.71	0.00	0.00	16.16
Totals		306.00	\$9,445	\$6,712	\$0	\$0	\$16,157
0914100200	SWITCHGEAR INST, INCL SWBD, PANELS & CIRC BKR, 400 AMPS					1.00 EACH	
Unit values		50.36	2731.70	1099.80	0.00	0.00	3831.50
Totals		50.36	\$2,732	\$1,100	\$0	\$0	\$3,832
A09 ELECTRICAL		357	\$12,177	\$7,812	\$0	\$0	\$19,989

=====						
Line #	Description					

	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
0205541750	PAVEMENT REMOVAL, BITUMINOUS, 4" TO 6" THICK					
					20.00 S.Y.	
Unit values	0.10	0.00	1.73	2.50	0.00	4.23
Totals	1.90	\$0	\$35	\$50	\$0	\$85
0205543200	SITE REMOVAL, STEEL PIPE, WELDED CONNECTION, 4" DIAMETER					
					500.00 L.F.	
Unit values	0.15	0.00	2.61	1.06	0.00	3.68
Totals	75.00	\$0	\$1,306	\$532	\$0	\$1,838
0207183600	HVAC DEMO, MECH EQPT HEAVY ITEM					
					0.50 Ton	
Unit values	14.55	0.00	314.87	0.00	0.00	314.87
Totals	7.27	\$0	\$157	\$0	\$0	\$157
0208400600	REMOVE PIPE INSULATION UP TO 4" DIAMETER PIPE					
					500.00 L.F.	
Unit values	0.07	0.00	1.63	0.20	0.00	1.83
Totals	35.50	\$0	\$817	\$98	\$0	\$915
0208401000	REMOVE INSULATION FROM PIPE FITTING, UP TO 4" DIAMETER PIPE					
					75.00 Ea.	
Unit values	0.20	0.00	4.60	0.56	0.00	5.16
Totals	15.00	\$0	\$345	\$42	\$0	\$387
0222540060	EXCAV TRENCH, COMMON EARTH, 1'-4' DEEP, 1/2 CY TRAC/LDR/B'HOE					
					15.00 C.Y.	
Unit values	0.08	0.00	1.47	1.17	0.00	2.64
Totals	1.20	\$0	\$22	\$17	\$0	\$39
0222541900	TAMPING TRENCH B'FILL, VIBRATING PLATE, ADD					
					15.00 C.Y.	
Unit values	0.09	0.00	1.44	0.55	0.00	1.99
Totals	1.34	\$0	\$22	\$8	\$0	\$30
0222543020	BACKFILL TRENCH, F.E. LOADER, WHEEL MTD., 1CY BUCKET, MIN HAUL					
					15.00 C.Y.	
Unit values	0.03	0.00	0.58	0.48	0.00	1.06
Totals	0.45	\$0	\$9	\$7	\$0	\$16
0251040380	ASPHALTIC CONCRETE PAVEMENT, PAVING, WEARING COURSE, 2" THICK					
					20.00 S.Y.	
Unit values	0.02	2.96	0.27	0.25	0.00	3.48
Totals	0.30	\$59	\$5	\$5	\$0	\$69

```
=====
Line #      Description
-----
      Manhours   Matl     Labor   Equipment   Sub     Total
=====
U02 SITEWORK      138       $59    $2,718     $759       $0    $3,536
0331305010      6" THICK SLAB FOR NEW TRANSFORMER
Unit values      0.02       1.45    0.28      0.00      48.00 S.F. 1.73
Totals           1.15       $70     $13       $0        0.00      $83
U03 CONCRETE       2        $70     $13       $0        $0      $83
=====
```

```
=====
Line #      Description
-----
      Manhours  Matl    Labor  Equipment  Sub    Total
=====

1554512150  HTG INFRA RED ELEC 27KW 92151BTU
Unit values      4.00    879.31    66.55    0.00    7.00 Ea.
Totals          28.00   $6,155    $466     $0    0.00    945.86
              28.00   $6,155    $466     $0     $0    $6,621

1574205220  ELECTRIC THERMOSTAT W/ COVER AND WIRING
Unit values      1.00    74.93    20.81    0.00    7.00 Ea.
Totals          7.00    $524    $146     $0    0.00    95.74
              7.00    $524    $146     $0     $0    $670

U15 MECHANICAL      35    $6,679    $612     $0     $0    $7,291
```

=====						
Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1611400600	MINERAL INSULATED CABLE 600V 1 #4					
					2.00 C.L.F.	
Unit values	6.67	402.81	103.21	0.00	0.00	506.02
Totals	13.33	\$806	\$206	\$0	\$0	\$1,012
1611400800	MINERAL INSULATED CABLE 600V 1 #2					
					4.00 C.L.F.	
Unit values	7.27	537.08	112.80	0.00	0.00	649.88
Totals	29.09	\$2,148	\$451	\$0	\$0	\$2,599
1621100220	OUTLET BOXES STEEL, 4" SQ, 2-1/8" DEEP, 1" K.O.'S					
					7.00 Ea.	
Unit values	0.40	2.36	6.20	0.00	0.00	8.57
Totals	2.80	\$17	\$43	\$0	\$0	\$60
1621100250	OUTLET BOX STEEL 4" COVERS BLANK					
					7.00 Ea.	
Unit values	0.13	0.54	1.94	0.00	0.00	2.48
Totals	0.88	\$4	\$14	\$0	\$0	\$18
1631200100	HEATING SYSTEM POWER / CONTROL PANEL					
					3.00 Ea.	
Unit values	2.96	320.72	45.97	0.00	0.00	366.69
Totals	8.89	\$962	\$138	\$0	\$0	\$1,100
1641600300	TRANSFORMER OIL PAD 15KV 480V 3P500KVA					
					1.00 Ea.	
Unit values	50.00	11760.20	775.50	146.08	0.00	12681.78
Totals	50.00	\$11,760	\$776	\$146	\$0	\$12,682
1671104800	UNDERGROUND DUCT BANK PVC TYPE EB 4 - 2" DIA					
					150.00 L.F.	
Unit values	0.13	1.48	2.07	0.00	0.00	3.55
Totals	19.95	\$222	\$310	\$0	\$0	\$532
U16 ELECTRICAL	125	\$15,919	\$1,938	\$146	\$0	\$18,003

```
=====
Line #      Description
-----
      Manhours   Matl     Labor   Equipment   Sub     Total
=====
```

ESTIMATE TOTAL	657	\$34,904	\$13,093	\$905	\$0	\$48,902
SALES TAX	0.00%	\$0				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$34,904	\$13,093	\$905	\$0	\$48,902
CONTINGENCY	10.00%					\$4,890
BOND	0.00%					\$0
PROFIT	10.00%					\$4,890
JOB TOTAL						\$58,682

```

=====
Estimate:      BLDG  4242      Date:      28-Nov-94
Description:    ELECTRIC INFRARED HEATING SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG,N.C  Job #:      94013.04
Sq. footage:   6000          City indx:Raleigh, NC
=====

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SUMMARY

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-----
Manhours  Matl  Labor  Equipment  Sub  Total
=====
A09 ELECTRICAL      357   $12,177   $7,812         $0     $0   $19,989
U02 SITEWORK        138     $59    $2,718    $759     $0   $3,536
U03 CONCRETE         2     $70     $13         $0     $0    $83
U15 MECHANICAL       35   $6,679    $612         $0     $0   $7,291
U16 ELECTRICAL      125   $15,919   $1,938    $146     $0  $18,003

TOTAL              657   $34,904   $13,093    $905     $0  $48,902

SALES TAX           0.00%      $0
MATL MARKUP         0.00%      $0
LABOR MARKUP        0.00%      $0
EQUIPT MARKUP       0.00%      $0
SUB MARKUP          0.00%      $0

TOTAL BEFORE CONTINGENC  $34,904   $13,093    $905     $0  $48,902
CONTINGENCY          10.00%      $4,890
BOND                 0.00%      $0
PROFIT               10.00%      $4,890

JOB TOTAL                                           $58,682

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LIFE CYCLE COST ANALYSIS SUMMARY

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) STUDY: 7937ECO3
 INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3
 PROJECT NO. & TITLE: 94013.04 LES: ECO3 - ELECTRIC INFRARED HEAT
 FISCAL YEAR 95 DISCRETE PORTION NAME: ECO
 ANALYSIS DATE: 12-05-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	197918.		
B. SIOH	\$	9896.		
C. DESIGN COST	\$	9896.		
D. TOTAL COST (1A+1B+1C)	\$	217710.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.		
F. PUBLIC UTILITY COMPANY REBATE	\$	0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)			\$	217710.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	-445.	\$ -15548.	15.08	\$ -234467.
B. DIST	\$ 19.18	2615.	\$ 50165.	18.57	\$ 931555.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	0.	\$ 0.	18.58	\$ 0.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ -54113.	14.88	\$ -805201.
N. TOTAL		2171.	\$ -19497.		\$ -108113.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$	2154.
(1) DISCOUNT FACTOR (TABLE A)		14.88	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$	32045.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+) COST(-) (4)
d. TOTAL	\$	0.		0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-) (3A2+3Bd4) \$ 32045.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ -17343.

5. SIMPLE PAYBACK PERIOD (1G/4) -12.55 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ -76069.

7. SAVINGS TO INVESTMENT RATIO (SIR) = $(6 / 1G) =$ -.35
 (IF < 1 PROJECT DOES NOT QUALIFY)

**** Project does not qualify for ECIP funding; 4,5,6 for information only.

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): N/A

```

=====
Estimate:      BLDG 7937      Date:      28-Nov-94
Description:    ELECTRIC INFRARED HEATING SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG,N.C Job #:      94013.04
Sq. footage:   37842        City indx:Raleigh, NC
=====

```

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0913100280	FEEDER INSTALLATION, INCLUDING CONDUIT AND WIRE, 200 AMPERES					3000.00 L.F.	
Unit values		0.31	9.45	6.71	0.00	0.00	16.16
Totals		918.00	\$28,336	\$20,135	\$0	\$0	\$48,471
0914100360	SWITCHGEAR INST, INCL SWBD, PANELS & CIRC BKR, 1600 AMPERES					1.00 EACH	
Unit values		208.17	13519.60	4568.40	0.00	0.00	18088.00
Totals		208.17	\$13,520	\$4,568	\$0	\$0	\$18,088
A09 ELECTRICAL		1127	\$41,856	\$24,703	\$0	\$0	\$66,559

=====						
Line #	Description					

	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
0205541750	PAVEMENT REMOVAL, BITUMINOUS, 4" TO 6" THICK					
					40.00 S.Y.	
Unit values	0.10	0.00	1.73	2.50	0.00	4.23
Totals	3.80	\$0	\$69	\$100	\$0	\$169
0205543200	SITE REMOVAL, STEEL PIPE, WELDED CONNECTION, 4" DIAMETER					
					3000.00 L.F.	
Unit values	0.15	0.00	2.61	1.06	0.00	3.68
Totals	450.00	\$0	\$7,838	\$3,191	\$0	\$11,029
0207183600	HVAC DEMO, MECH EQPT HEAVY ITEM					
					2.00 Ton	
Unit values	14.55	0.00	314.87	0.00	0.00	314.87
Totals	29.09	\$0	\$630	\$0	\$0	\$630
0208400600	REMOVE PIPE INSULATION UP TO 4" DIAMETER PIPE					
					3000.00 L.F.	
Unit values	0.07	0.00	1.63	0.20	0.00	1.83
Totals	213.00	\$0	\$4,902	\$587	\$0	\$5,489
0208401000	REMOVE INSULATION FROM PIPE FITTING, UP TO 4" DIAMETER PIPE					
					400.00 Ea.	
Unit values	0.20	0.00	4.60	0.56	0.00	5.16
Totals	80.00	\$0	\$1,838	\$225	\$0	\$2,063
0222540060	EXCAV TRENCH, COMMON EARTH, 1'-4' DEEP, 1/2 CY TRAC/LDR/B'HOE					
					25.00 C.Y.	
Unit values	0.08	0.00	1.47	1.17	0.00	2.64
Totals	2.00	\$0	\$37	\$29	\$0	\$66
0222541900	TAMPING TRENCH B'FILL, VIBRATING PLATE, ADD					
					25.00 C.Y.	
Unit values	0.09	0.00	1.44	0.55	0.00	1.99
Totals	2.23	\$0	\$36	\$14	\$0	\$50
0222543020	BACKFILL TRENCH, F.E. LOADER, WHEEL MTD., 1CY BUCKET, MIN HAUL					
					25.00 C.Y.	
Unit values	0.03	0.00	0.58	0.48	0.00	1.06
Totals	0.75	\$0	\$14	\$12	\$0	\$26
0251040380	ASPHALTIC CONCRETE PAVEMENT, PAVING, WEARING COURSE, 2" THICK					
					40.00 S.Y.	
Unit values	0.02	2.96	0.27	0.25	0.00	3.48
Totals	0.60	\$118	\$11	\$10	\$0	\$139

```
=====
Line #      Description
-----
      Manhours  Matl    Labor  Equipment  Sub    Total
=====
U02 SITEWORK      782      $118   $15,375   $4,168      $0   $19,661
0331305010      6" THICK SLAB FOR NEW TRANSFORMER
Unit values      0.02      1.45      0.28      0.00      48.00 S.F.  1.73
Totals           1.15      $70      $13      $0      $0      $83

U03 CONCRETE      2      $70      $13      $0      $0      $83
=====
```

=====						
Line #	Description					

	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1554512050	HTG INFRA RED ELEC 6KW 20478BTU					
					6.00 Ea.	
Unit values	2.67	334.67	44.47	0.00	0.00	379.13
Totals	16.00	\$2,008	\$267	\$0	\$0	\$2,275
1554512100	HTG INFRA RED ELEC 13.5KW 46075.5BTU					
					6.00 Ea.	
Unit values	3.20	455.20	53.24	0.00	0.00	508.44
Totals	19.20	\$2,731	\$319	\$0	\$0	\$3,050
1554512150	HTG INFRA RED ELEC 27KW 92151BTU					
					39.00 Ea.	
Unit values	4.00	879.31	66.55	0.00	0.00	945.86
Totals	156.00	\$34,293	\$2,595	\$0	\$0	\$36,888
1574205220	ELECTRIC THERMOSTAT W/ COVER AND WIRING					
					51.00 Ea.	
Unit values	1.00	74.93	20.81	0.00	0.00	95.74
Totals	51.00	\$3,821	\$1,061	\$0	\$0	\$4,882
U15 MECHANICAL	243	\$42,853	\$4,242	\$0	\$0	\$47,095

=====						
Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1611400600	MINERAL INSULATED CABLE 600V 1 #4					
					3.50 C.L.F.	
Unit values	6.67	402.81	103.21	0.00	0.00	506.02
Totals	23.33	\$1,410	\$361	\$0	\$0	\$1,771
1611400800	MINERAL INSULATED CABLE 600V 1 #2					
					7.00 C.L.F.	
Unit values	7.27	537.08	112.80	0.00	0.00	649.88
Totals	50.91	\$3,760	\$790	\$0	\$0	\$4,550
1621100220	OUTLET BOXES STEEL, 4" SQ, 2-1/8" DEEP, 1" K.O.'S					
					51.00 Ea.	
Unit values	0.40	2.36	6.20	0.00	0.00	8.57
Totals	20.40	\$120	\$316	\$0	\$0	\$436
1621100250	OUTLET BOX STEEL 4" COVERS BLANK					
					51.00 Ea.	
Unit values	0.13	0.54	1.94	0.00	0.00	2.48
Totals	6.38	\$27	\$99	\$0	\$0	\$126
1631200100	HEATING SYSTEM POWER / CONTROL PANEL					
					13.00 Ea.	
Unit values	2.96	320.72	45.97	0.00	0.00	366.69
Totals	38.52	\$4,169	\$598	\$0	\$0	\$4,767
1641600500	TRANSFORMER OIL PAD 15KV 480V 3P1000KVA					
					1.00 Ea.	
Unit values	76.92	17408.80	1184.40	225.60	0.00	18818.80
Totals	76.92	\$17,409	\$1,184	\$226	\$0	\$18,819
1671104800	UNDERGROUND DUCT BANK PVC TYPE EB 4 - 2" DIA					
					300.00 L.F.	
Unit values	0.13	1.48	2.07	0.00	0.00	3.55
Totals	39.90	\$444	\$621	\$0	\$0	\$1,065
U16 ELECTRICAL	257	\$27,339	\$3,969	\$226	\$0	\$31,534

```
=====
Line #      Description
-----
      Manhours   Matl    Labor   Equipment   Sub    Total
=====
```

ESTIMATE TOTAL	2411	\$112,236	\$48,302	\$4,394	\$0	\$164,932
SALES TAX	0.00%	\$0				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$112,236	\$48,302	\$4,394	\$0	\$164,932
CONTINGENCY	10.00%					\$16,493
BOND	0.00%					\$0
PROFIT	10.00%					\$16,493
JOB TOTAL						\$197,918

```

=====
Estimate:      BLDG 7937      Date:      28-Nov-94
Description:   ELECTRIC INFRARED HEATING SYSTEM COST ESTIMATE
Project:      LIMITED EEAP(HGR) Bid Date:
Location:     FORT BRAGG,N.C  Job #:      94013.04
Sq. footage:  37842          City indx:Raleigh, NC
=====

```

SUMMARY

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-----
              Manhours   Matl      Labor   Equipment   Sub      Total
=====
A09 ELECTRICAL      1127    $41,856    $24,703         $0         $0    $66,559
U02 SITEWORK        782      $118    $15,375    $4,168         $0    $19,661
U03 CONCRETE         2        $70      $13          $0         $0      $83
U15 MECHANICAL      243    $42,853    $4,242          $0         $0    $47,095
U16 ELECTRICAL      257    $27,339    $3,969    $226         $0    $31,534

TOTAL              2411    $112,236    $48,302    $4,394         $0    $164,932

SALES TAX           0.00%          $0
MATL MARKUP         0.00%          $0
LABOR MARKUP        0.00%          $0
EQUIPT MARKUP       0.00%          $0
SUB MARKUP          0.00%          $0

TOTAL BEFORE CONTINGENC $112,236    $48,302    $4,394         $0    $164,932
CONTINGENCY          10.00%          $16,493
BOND                 0.00%          $0
PROFIT               10.00%          $16,493

JOB TOTAL                                     $197,918

```


LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 8944ECO3

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) LCCID FY95 (92)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 94013.04 LES: ECO3 - ELECTRIC INFRARED HEAT

FISCAL YEAR 95 DISCRETE PORTION NAME: ECO

ANALYSIS DATE: 12-05-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	192848.	
B. SIOH	\$	9642.	
C. DESIGN COST	\$	8642.	
D. TOTAL COST (1A+1B+1C)	\$	211132.	
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.	
F. PUBLIC UTILITY COMPANY REBATE	\$	0.	
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$	211132.	

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	-326.	\$ -11403.	15.08	\$ -171954.
B. DIST	\$ 19.18	2762.	\$ 52974.	18.57	\$ 983724.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	0.	\$ 0.	18.58	\$ 0.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ -53211.	14.88	\$ -791780.
N. TOTAL		2436.	\$ -11640.		\$ 19990.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)

(1) DISCOUNT FACTOR (TABLE A)	14.88	\$ 6454.
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$ 96039.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-) (3A2+3Bd4) \$ 96039.

4. FIRST YEAR DOLLAR SAVINGS 2N3+3A+(3Bd1/(YRS ECONOMIC LIFE)) \$ -5186.

5. SIMPLE PAYBACK PERIOD (1G/4) -40.71 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 116029.

7. SAVINGS TO INVESTMENT RATIO (SIR)=(6 / 1G)= .55
(IF < 1 PROJECT DOES NOT QUALIFY)

**** Project does not qualify for ECIP funding; 4,5,6 for information only.

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): N/A

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Estimate:      BLDG  8944      Date:      28-Nov-94
Description:    ELECTRIC INFRARED HEATING SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG,N.C  Job #:      94013.04
Sq. footage:   38099          City indx:Raleigh, NC
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Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0913100280	FEEDER INSTALLATION, INCLUDING CONDUIT AND WIRE, 200 AMPERES					2800.00 L.F.	
Unit values		0.31	9.45	6.71	0.00	0.00	16.16
Totals		856.80	\$26,447	\$18,792	\$0	\$0	\$45,239
0914100360	SWITCHGEAR INST, INCL SWBD, PANELS & CIRC BKR, 1600 AMPERES					1.00 EACH	
Unit values		208.17	13519.60	4568.40	0.00	0.00	18088.00
Totals		208.17	\$13,520	\$4,568	\$0	\$0	\$18,088
A09 ELECTRICAL		1065	\$39,967	\$23,360	\$0	\$0	\$63,327

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Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
0205541750	PAVEMENT REMOVAL, BITUMINOUS, 4" TO 6" THICK					
					40.00 S.Y.	
Unit values	0.10	0.00	1.73	2.50	0.00	4.23
Totals	3.80	\$0	\$69	\$100	\$0	\$169
0205543200	SITE REMOVAL, STEEL PIPE, WELDED CONNECTION, 4" DIAMETER					
					3000.00 L.F.	
Unit values	0.15	0.00	2.61	1.06	0.00	3.68
Totals	450.00	\$0	\$7,838	\$3,191	\$0	\$11,029
0207183600	HVAC DEMO, MECH EQPT HEAVY ITEM					
					2.00 Ton	
Unit values	14.55	0.00	314.87	0.00	0.00	314.87
Totals	29.09	\$0	\$630	\$0	\$0	\$630
0208400600	REMOVE PIPE INSULATION UP TO 4" DIAMETER PIPE					
					3000.00 L.F.	
Unit values	0.07	0.00	1.63	0.20	0.00	1.83
Totals	213.00	\$0	\$4,902	\$587	\$0	\$5,489
0208401000	REMOVE INSULATION FROM PIPE FITTING, UP TO 4" DIAMETER PIPE					
					400.00 Ea.	
Unit values	0.20	0.00	4.60	0.56	0.00	5.16
Totals	80.00	\$0	\$1,838	\$225	\$0	\$2,063
0222540060	EXCAV TRENCH, COMMON EARTH, 1'-4' DEEP, 1/2 CY TRAC/LDR/B'HOE					
					25.00 C.Y.	
Unit values	0.08	0.00	1.47	1.17	0.00	2.64
Totals	2.00	\$0	\$37	\$29	\$0	\$66
0222541900	TAMPING TRENCH B'FILL, VIBRATING PLATE, ADD					
					25.00 C.Y.	
Unit values	0.09	0.00	1.44	0.55	0.00	1.99
Totals	2.23	\$0	\$36	\$14	\$0	\$50
0222543020	BACKFILL TRENCH, F.E. LOADER, WHEEL MTD., 1CY BUCKET, MIN HAUL					
					25.00 C.Y.	
Unit values	0.03	0.00	0.58	0.48	0.00	1.06
Totals	0.75	\$0	\$14	\$12	\$0	\$26
0251040380	ASPHALTIC CONCRETE PAVEMENT, PAVING, WEARING COURSE, 2" THICK					
					40.00 S.Y.	
Unit values	0.02	2.96	0.27	0.25	0.00	3.48
Totals	0.60	\$118	\$11	\$10	\$0	\$139

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Line #      Description
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            Manhours  Matl    Labor  Equipment  Sub    Total
=====
U02 SITEWORK      782      $118   $15,375   $4,168      $0   $19,661
0331305010      6" THICK SLAB FOR NEW TRANSFORMER
Unit values      0.02      1.45      0.28      0.00      48.00 S.F.
Totals           1.15      $70      $13      $0      0.00      1.73
                        $0      $0      $0      $0
U03 CONCRETE      2      $70      $13      $0      $0      $83
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Line #      Description
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              Manhours  Matl      Labor   Equipment   Sub      Total
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1554512050   HTG INFRA RED ELEC 6KW 20478BTU
Unit values      2.67    334.67    44.47      0.00      5.00 Ea.
Totals          13.34    $1,673    $222      $0      0.00    379.13
              13.34    $1,673    $222      $0      $0      $1,895

1554512100   HTG INFRA RED ELEC 13.5KW 46075.5BTU
Unit values      3.20    455.20    53.24      0.00      5.00 Ea.
Totals          16.00    $2,276    $266      $0      0.00    508.44
              16.00    $2,276    $266      $0      $0      $2,542

1554512150   HTG INFRA RED ELEC 27KW 92151BTU
Unit values      4.00    879.31    66.55      0.00      39.00 Ea.
Totals          156.00    $34,293    $2,595      $0      0.00    945.86
              156.00    $34,293    $2,595      $0      $0      $36,888

1574205220   ELECTRIC THERMOSTAT W/ COVER AND WIRING
Unit values      1.00     74.93    20.81      0.00      50.00 Ea.
Totals          50.00    $3,746    $1,041      $0      0.00    95.74
              50.00    $3,746    $1,041      $0      $0      $4,787

U15 MECHANICAL    236    $41,988    $4,124      $0      50.00 Ea.
              236    $41,988    $4,124      $0      $0      $46,112

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Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1611400600	MINERAL INSULATED CABLE 600V 1 #4					
					3.50 C.L.F.	
Unit values	6.67	402.81	103.21	0.00	0.00	506.02
Totals	23.33	\$1,410	\$361	\$0	\$0	\$1,771
1611400800	MINERAL INSULATED CABLE 600V 1 #2					
					7.00 C.L.F.	
Unit values	7.27	537.08	112.80	0.00	0.00	649.88
Totals	50.91	\$3,760	\$790	\$0	\$0	\$4,550
1621100220	OUTLET BOXES STEEL, 4" SQ, 2-1/8" DEEP, 1" K.O.'S					
					50.00 Ea.	
Unit values	0.40	2.36	6.20	0.00	0.00	8.57
Totals	20.00	\$118	\$310	\$0	\$0	\$428
1621100250	OUTLET BOX STEEL 4" COVERS BLANK					
					50.00 Ea.	
Unit values	0.13	0.54	1.94	0.00	0.00	2.48
Totals	6.25	\$27	\$97	\$0	\$0	\$124
1631200100	HEATING SYSTEM POWER / CONTROL PANEL					
					13.00 Ea.	
Unit values	2.96	320.72	45.97	0.00	0.00	366.69
Totals	38.52	\$4,169	\$598	\$0	\$0	\$4,767
1641600500	TRANSFORMER OIL PAD 15KV 480V 3P1000KVA					
					1.00 Ea.	
Unit values	76.92	17408.80	1184.40	225.60	0.00	18818.80
Totals	76.92	\$17,409	\$1,184	\$226	\$0	\$18,819
1671104800	UNDERGROUND DUCT BANK PVC TYPE EB 4 - 2" DIA					
					300.00 L.F.	
Unit values	0.13	1.48	2.07	0.00	0.00	3.55
Totals	39.90	\$444	\$621	\$0	\$0	\$1,065
U16 ELECTRICAL	256	\$27,337	\$3,961	\$226	\$0	\$31,524

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Line #      Description
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      Manhours   Matl     Labor   Equipment   Sub     Total
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ESTIMATE TOTAL	2341	\$109,480	\$46,833	\$4,394	\$0	\$160,707
SALES TAX	0.00%	\$0				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$109,480	\$46,833	\$4,394	\$0	\$160,707
CONTINGENCY	10.00%					\$16,071
BOND	0.00%					\$0
PROFIT	10.00%					\$16,071
JOB TOTAL						\$192,848

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=====
Estimate:      BLDG 8944      Date:      28-Nov-94
Description:   ELECTRIC INFRARED HEATING SYSTEM COST ESTIMATE
Project:      LIMITED EEAP(HGR) Bid Date:
Location:     FORT BRAGG,N.C  Job #:      94013.04
Sq. footage:  38099          City indx:Raleigh, NC
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SUMMARY

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Manhours  Matl  Labor  Equipment  Sub  Total
=====
A09 ELECTRICAL  1065  $39,967  $23,360  $0  $0  $63,327
U02 SITEWORK    782    $118  $15,375  $4,168  $0  $19,661
U03 CONCRETE     2     $70   $13     $0  $0  $83
U15 MECHANICAL  236  $41,988  $4,124  $0  $0  $46,112
U16 ELECTRICAL  256  $27,337  $3,961  $226  $0  $31,524

TOTAL          2341  $109,480  $46,833  $4,394  $0  $160,707

SALES TAX      0.00%    $0
MATL MARKUP    0.00%    $0
LABOR MARKUP   0.00%    $0
EQUIPT MARKUP  0.00%    $0
SUB MARKUP     0.00%    $0

TOTAL BEFORE CONTINGENC $109,480  $46,833  $4,394  $0  $160,707
CONTINGENCY      10.00%    $16,071
BOND              0.00%    $0
PROFIT           10.00%    $16,071

JOB TOTAL                                $192,848

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LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 9647ECO3

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) LCCID FY95 (92)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 94013.04 LES: ECO3 - ELECTRIC INFRARED HEAT

FISCAL YEAR 95 DISCRETE PORTION NAME: ECO

ANALYSIS DATE: 12-05-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	214760.		
B. SIOH	\$	10738.		
C. DESIGN COST	\$	10738.		
D. TOTAL COST (1A+1B+1C)	\$	236236.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.		
F. PUBLIC UTILITY COMPANY REBATE	\$	0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$		236236.	

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	-300.	\$ -10475.	15.08	\$ -157966.
B. DIST	\$ 19.18	1887.	\$ 36195.	18.57	\$ 672140.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	0.	\$ 0.	18.58	\$ 0.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ -47522.	14.88	\$ -707127.
N. TOTAL		1587.	\$ -21802.		\$ -192953.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$ 1232.
(1) DISCOUNT FACTOR (TABLE A)	14.88	
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$ 18327.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-) (3A2+3Bd4) \$ 18327.

4. FIRST YEAR DOLLAR SAVINGS 2N3+3A+(3Bd1/(YRS ECONOMIC LIFE)) \$ -20571.

5. SIMPLE PAYBACK PERIOD (1G/4) -11.48 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ -174626.

7. SAVINGS TO INVESTMENT RATIO (SIR)=(6 / 1G)= -.74
(IF < 1 PROJECT DOES NOT QUALIFY)

**** Project does not qualify for ECIP funding; 4,5,6 for information only.

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): N/A

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Estimate:      BLDG  9647      Date:      28-Nov-94
Description:    ELECTRIC INFRARED HEATING SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG,N.C  Job #:      94013.04
Sq. footage:   31586          City indx:Raleigh, NC
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Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0913100280	FEEDER INSTALLATION, INCLUDING CONDUIT AND WIRE, 200 AMPERES					4000.00 L.F.	
Unit values		0.31	9.45	6.71	0.00	0.00	16.16
Totals		1224.00	\$37,781	\$26,846	\$0	\$0	\$64,627
0914100360	SWITCHGEAR INST, INCL SWBD, PANELS & CIRC BKR, 1600 AMPERES					1.00 EACH	
Unit values		208.17	13519.60	4568.40	0.00	0.00	18088.00
Totals		208.17	\$13,520	\$4,568	\$0	\$0	\$18,088
A09 ELECTRICAL		1433	\$51,301	\$31,414	\$0	\$0	\$82,715

=====						
Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
0205541750	PAVEMENT REMOVAL, BITUMINOUS, 4" TO 6" THICK					
					40.00 S.Y.	
Unit values	0.10	0.00	1.73	2.50	0.00	4.23
Totals	3.80	\$0	\$69	\$100	\$0	\$169
0205543200	SITE REMOVAL, STEEL PIPE, WELDED CONNECTION, 4" DIAMETER					
					4000.00 L.F.	
Unit values	0.15	0.00	2.61	1.06	0.00	3.68
Totals	600.00	\$0	\$10,450	\$4,255	\$0	\$14,705
0207183600	HVAC DEMO, MECH EQPT HEAVY ITEM					
					2.00 Ton	
Unit values	14.55	0.00	314.87	0.00	0.00	314.87
Totals	29.09	\$0	\$630	\$0	\$0	\$630
0208400600	REMOVE PIPE INSULATION UP TO 4" DIAMETER PIPE					
					4000.00 L.F.	
Unit values	0.07	0.00	1.63	0.20	0.00	1.83
Totals	284.00	\$0	\$6,536	\$783	\$0	\$7,319
0208401000	REMOVE INSULATION FROM PIPE FITTING, UP TO 4" DIAMETER PIPE					
					500.00 Ea.	
Unit values	0.20	0.00	4.60	0.56	0.00	5.16
Totals	100.00	\$0	\$2,298	\$281	\$0	\$2,579
0222540060	EXCAV TRENCH, COMMON EARTH, 1'-4' DEEP, 1/2 CY TRAC/LDR/B'HOE					
					25.00 C.Y.	
Unit values	0.08	0.00	1.47	1.17	0.00	2.64
Totals	2.00	\$0	\$37	\$29	\$0	\$66
0222541900	TAMPING TRENCH B'FILL, VIBRATING PLATE, ADD					
					25.00 C.Y.	
Unit values	0.09	0.00	1.44	0.55	0.00	1.99
Totals	2.23	\$0	\$36	\$14	\$0	\$50
0222543020	BACKFILL TRENCH, F.E. LOADER, WHEEL MTD., 1CY BUCKET, MIN HAUL					
					25.00 C.Y.	
Unit values	0.03	0.00	0.58	0.48	0.00	1.06
Totals	0.75	\$0	\$14	\$12	\$0	\$26
0251040380	ASPHALTIC CONCRETE PAVEMENT, PAVING, WEARING COURSE, 2" THICK					
					40.00 S.Y.	
Unit values	0.02	2.96	0.27	0.25	0.00	3.48
Totals	0.60	\$118	\$11	\$10	\$0	\$139

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=====
Line #      Description
-----
      Manhours  Matl    Labor  Equipment  Sub    Total
=====
U02 SITEWORK      1023      $118   $20,081   $5,484      $0   $25,683
0331305010      6" THICK SLAB FOR NEW TRANSFORMER
Unit values      0.02      1.45      0.28      0.00      48.00 S.F.  1.73
Totals           1.15      $70      $13      $0      $0      $83

U03 CONCRETE       2      $70      $13      $0      $0      $83
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=====						
Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1554512050	HTG INFRA RED ELEC 6KW 20478BTU					
					7.00 Ea.	
Unit values	2.67	334.67	44.47	0.00	0.00	379.13
Totals	18.67	\$2,343	\$311	\$0	\$0	\$2,654
1554512100	HTG INFRA RED ELEC 13.5KW 46075.5BTU					
					7.00 Ea.	
Unit values	3.20	455.20	53.24	0.00	0.00	508.44
Totals	22.40	\$3,186	\$373	\$0	\$0	\$3,559
1554512150	HTG INFRA RED ELEC 27KW 92151BTU					
					33.00 Ea.	
Unit values	4.00	879.31	66.55	0.00	0.00	945.86
Totals	132.00	\$29,017	\$2,196	\$0	\$0	\$31,213
1574205220	ELECTRIC THERMOSTAT W/ COVER AND WIRING					
					40.00 Ea.	
Unit values	1.00	74.93	20.81	0.00	0.00	95.74
Totals	40.00	\$2,997	\$832	\$0	\$0	\$3,829
U15 MECHANICAL	214	\$37,543	\$3,712	\$0	\$0	\$41,255

=====						
Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1611400600	MINERAL INSULATED CABLE 600V 1 #4					
Unit values	6.67	402.81	103.21	0.00	3.00 C.L.F.	
Totals	20.00	\$1,208	\$310	\$0	0.00	506.02
					\$0	\$1,518
1611400800	MINERAL INSULATED CABLE 600V 1 #2					
Unit values	7.27	537.08	112.80	0.00	6.00 C.L.F.	
Totals	43.64	\$3,222	\$677	\$0	0.00	649.88
					\$0	\$3,899
1621100220	OUTLET BOXES STEEL, 4" SQ, 2-1/8" DEEP, 1" K.O.'S					
Unit values	0.40	2.36	6.20	0.00	40.00 Ea.	
Totals	16.00	\$94	\$248	\$0	0.00	8.57
					\$0	\$342
1621100250	OUTLET BOX STEEL 4" COVERS BLANK					
Unit values	0.13	0.54	1.94	0.00	40.00 Ea.	
Totals	5.00	\$21	\$78	\$0	0.00	2.48
					\$0	\$99
1631200100	HEATING SYSTEM POWER / CONTROL PANEL					
Unit values	2.96	320.72	45.97	0.00	10.00 Ea.	
Totals	29.63	\$3,207	\$460	\$0	0.00	366.69
					\$0	\$3,667
1641600500	TRANSFORMER OIL PAD 15KV 480V 3P1000KVA					
Unit values	76.92	17408.80	1184.40	225.60	1.00 Ea.	
Totals	76.92	\$17,409	\$1,184	\$226	0.00	18818.80
					\$0	\$18,819
1671104800	UNDERGROUND DUCT BANK PVC TYPE EB 4 - 2" DIA					
Unit values	0.13	1.48	2.07	0.00	250.00 L.F.	
Totals	33.25	\$370	\$517	\$0	0.00	3.55
					\$0	\$887
U16 ELECTRICAL	225	\$25,531	\$3,474	\$226	\$0	\$29,231

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=====
Line #      Description
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              Manhours   Matl      Labor   Equipment   Sub      Total
=====

ESTIMATE TOTAL      2897   $114,563   $58,694   $5,710           $0   $178,967

SALES TAX            0.00%           $0
MATL MARKUP          0.00%           $0
LABOR MARKUP         0.00%           $0
EQUIPT MARKUP        0.00%           $0
SUB MARKUP           0.00%           $0

TOTAL BEFORE CONTINGENC $114,563   $58,694   $5,710           $0   $178,967
CONTINGENCY           10.00%           $17,897
BOND                  0.00%           $0
PROFIT                10.00%           $17,897

JOB TOTAL                                     $214,760
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Estimate:      BLDG  9647          Date:      28-Nov-94
Description:    ELECTRIC INFRARED HEATING SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG,N.C   Job #:      94013.04
Sq. footage:   31586           City indx:Raleigh, NC
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SUMMARY

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              Manhours   Matl     Labor   Equipment   Sub       Total
=====
A09 ELECTRICAL      1433    $51,301   $31,414         $0         $0    $82,715
U02 SITEWORK        1023         $118   $20,081    $5,484         $0    $25,683
U03 CONCRETE         2          $70     $13           $0         $0     $83
U15 MECHANICAL      214    $37,543   $3,712           $0         $0    $41,255
U16 ELECTRICAL      225    $25,531   $3,474    $226         $0    $29,231

TOTAL                2897   $114,563   $58,694    $5,710         $0   $178,967

SALES TAX            0.00%         $0
MATL MARKUP          0.00%         $0
LABOR MARKUP         0.00%         $0
EQUIPT MARKUP        0.00%         $0
SUB MARKUP           0.00%         $0

TOTAL BEFORE CONTINGENC $114,563   $58,694    $5,710         $0   $178,967
CONTINGENCY           10.00%         $0
BOND                  0.00%         $0
PROFIT                10.00%         $0

JOB TOTAL                                     $214,760

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10 ECO - 4 LIFE CYCLE COST ANALYSES

LIMITED ENERGY STUDY OF HANGAR FACILITIES AT SIMMONS ARMY AIRFIELD, FT. BRAGG, NC

This section contains the life-cycle cost analyses and construction cost estimates for ECO-4: HVAC Renovations. The analyses and estimates are sorted by building number.

LCCA ECO-4 - ALL BUILDINGS 10-2

LCCA AND COST ESTIMATE: (sorted by building)

2936	10-3
3262	10-11
3354	10-19
3637	10-29
3642	10-38
3962	10-47
4137	10-56
4242	10-65

LCCA ECO-4

All Buildings

LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: ECO4TOTL
LCCID FY95 (92)

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 94013.04 LES: ECO4 - TOTAL ALL BUILDINGS

FISCAL YEAR 95 DISCRETE PORTION NAME: ECO

ANALYSIS DATE: 12-13-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	798044.		
B. SIOH	\$	39902.		
C. DESIGN COST	\$	39902.		
D. TOTAL COST (1A+1B+1C)	\$	877848.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.		
F. PUBLIC UTILITY COMPANY REBATE	\$	0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)			\$	877848.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	-51.	\$ -1775.	15.08	\$ -26769.
B. DIST	\$ 19.18	1202.	\$ 23052.	18.57	\$ 428080.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	0.	\$ 0.	18.58	\$ 0.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 4440.	14.88	\$ 66067.
N. TOTAL		1151.	\$ 25717.		\$ 467379.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)

(1) DISCOUNT FACTOR (TABLE A)	14.88	\$	20402.
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$	303582.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-) (3A2+3Bd4) \$ 303582.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ 46119.

5. SIMPLE PAYBACK PERIOD (1G/4) 19.03 YEAR

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 770961.

7. SAVINGS TO INVESTMENT RATIO (SIR) = $(6 / 1G) = .88$
(IF < 1 PROJECT DOES NOT QUALIFY)

**** Project does not qualify for ECIP funding; 4,5,6 for information only.

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): N/A

LCCA & COST ESTIMATE

(sorted by building)

LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 2936ECO4

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) LCCID FY95 (92)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 94013.04 LES: ECO4 - HVAC RENOVATIONS

FISCAL YEAR 95 DISCRETE PORTION NAME: ECO

ANALYSIS DATE: 12-12-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	111823.	
B. SIOH	\$	5591.	
C. DESIGN COST	\$	5591.	
D. TOTAL COST (1A+1B+1C)	\$	123005.	
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.	
F. PUBLIC UTILITY COMPANY REBATE	\$	0.	
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$		123005.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH (1)	SAVINGS MWH/YR (2)	ANNUAL \$ SAVINGS (3)	DISCOUNT FACTOR (4)	DISCOUNTED SAVINGS (5)
A. ELECT	\$ 34.95	87.	\$ 3032.	15.08	\$ 45721.
B. DIST	\$ 19.18	1.	\$ 21.	18.57	\$ 392.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	0.	\$ 0.	18.58	\$ 0.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 555.	14.88	\$ 8258.
N. TOTAL		88.	\$ 3608.		\$ 54371.

3. NON ENERGY SAVINGS (+) / COST (-)

A. ANNUAL RECURRING (+/-)			
(1) DISCOUNT FACTOR (TABLE A)		14.88	\$ 2374.
(2) DISCOUNTED SAVING/COST (3A X 3A1)			\$ 35319.

B. NON RECURRING SAVINGS (+) / COSTS (-)

ITEM	SAVINGS (+) COST (-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS (+) / COST (-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS (+) / COST (-) (3A2+3Bd4) \$ 35319.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ 5982.

5. SIMPLE PAYBACK PERIOD (1G/4) 20.56 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 89690.

7. SAVINGS TO INVESTMENT RATIO (SIR) = (6 / 1G) = .73
(IF < 1 PROJECT DOES NOT QUALIFY)

**** Project does not qualify for ECIP funding; 4,5,6 for information only.

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): N/A

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=====
Estimate:      BLDG 2936      Date:      02-Dec-94
Description:   RENOVATE HVAC SYSTEM COST ESTIMATE (Replace Existing HVAC
Project:       LIMITED EEAP(HGR) Bid Date:      (EXCEPT
Location:      FORT BRAGG, N.C. Job #:      94013.04
Sq. footage:   *****      City indx:Raleigh, NC
=====

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Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0913100280	FEEDER INSTALLATION, INCLUDING CONDUIT AND WIRE, 200 AMPERES					300.00 L.F.	
Unit values		0.31	9.45	6.71	0.00	0.00	16.16
Totals		91.80	\$2,834	\$2,013	\$0	\$0	\$4,847
A09 ELECTRICAL		92	\$2,834	\$2,013	\$0	\$0	\$4,847

=====						
Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
0205543200	SITE REMOVAL, STEEL PIPE, WELDED CONNECTION, 4" DIAMETER					200.00 L.F.
Unit values	0.15	0.00	2.61	1.06	0.00	3.68
Totals	30.00	\$0	\$523	\$213	\$0	\$736
0207181240	HVAC DEMO, DUCTWORK, 10" HI X 24" WIDE					50.00 L.F.
Unit values	0.07	0.00	1.17	0.00	0.00	1.17
Totals	3.65	\$0	\$59	\$0	\$0	\$59
0207183600	HVAC DEMO, MECH EQPT HEAVY ITEM					7.00 Ton
Unit values	14.55	0.00	314.87	0.00	0.00	314.87
Totals	101.82	\$0	\$2,204	\$0	\$0	\$2,204
0208400600	REMOVE PIPE INSULATION UP TO 4" DIAMETER PIPE					200.00 L.F.
Unit values	0.07	0.00	1.63	0.20	0.00	1.83
Totals	14.20	\$0	\$327	\$39	\$0	\$366
0208401000	REMOVE INSULATION FROM PIPE FITTING, UP TO 4" DIAMETER PIPE					50.00 Ea.
Unit values	0.20	0.00	4.60	0.56	0.00	5.16
Totals	10.00	\$0	\$230	\$28	\$0	\$258
0222541900	TAMPING TRENCH B'FILL, VIBRATING PLATE, ADD					4.50 C.Y.
Unit values	0.09	0.00	1.44	0.55	0.00	1.99
Totals	0.40	\$0	\$6	\$2	\$0	\$8
0222582800	TRENCH EXCVTNG 40HP CHNTRNCHR&BKFL 12"W24"D					60.00 L.F.
Unit values	0.01	0.00	0.20	0.20	0.00	0.39
Totals	0.60	\$0	\$12	\$12	\$0	\$24
0260120200	BEDDING, FOR PIPE IN TRENCH SAND, DEAD OR BANK					1.50 C.Y.
Unit values	0.16	3.79	2.79	1.13	0.00	7.71
Totals	0.24	\$6	\$4	\$2	\$0	\$12
0260120500	BEDDING, PLACING IN TRENCH					1.50 C.Y.
Unit values	0.09	0.00	1.44	0.55	0.00	1.99
Totals	0.13	\$0	\$2	\$1	\$0	\$3

=====						
Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
U02 SITEWORK	162	\$6	\$3,367	\$297	\$0	\$3,670
1517010620	BLACK STEEL PIPE, SCHEDULE 40, THREADED, 2-1/2" DI W/CPLGS&HNGRS 10' OC					100.00 L.F.
Unit values	0.32	6.64	4.93	0.00	0.00	11.57
Totals	32.00	\$664	\$493	\$0	\$0	\$1,157
1556517150	PIPE CVR FBGL 1.5"THK ASJ 2-1/2"IPS					1000.00 L.F.
Unit values	0.09	1.65	1.30	0.00	0.00	2.95
Totals	89.00	\$1,648	\$1,301	\$0	\$0	\$2,949
1556519680	PIPE CVR URTNAN ULTV ELL 1.5W 1"IPS					70.00 Ea.
Unit values	0.17	6.49	2.47	0.00	0.00	8.96
Totals	11.76	\$455	\$173	\$0	\$0	\$628
1556519840	PIPE CVR URETH UV TEE/VLV 1"W 1"IPS					30.00 Ea.
Unit values	0.24	7.79	3.54	0.00	0.00	11.33
Totals	7.26	\$234	\$106	\$0	\$0	\$340
1571801160	ROOF TOP A/C SINGLE ZONE 10 TON					1.00 Ea.
Unit values	52.17	8016.98	831.88	0.00	0.00	8848.85
Totals	52.17	\$8,017	\$832	\$0	\$0	\$8,849
1571801170	ROOF TOP A/C SINGLE ZONE 12.5 TON					2.00 Ea.
Unit values	63.16	9140.85	1013.38	0.00	0.00	10154.23
Totals	126.32	\$18,282	\$2,027	\$0	\$0	\$20,309
1571801180	ROOFTOP AC SINGLE ZONE 15 TON					1.00 Ea.
Unit values	77.42	10589.40	1240.25	0.00	0.00	11829.65
Totals	77.42	\$10,589	\$1,240	\$0	\$0	\$11,829
1571900536	WATER CHILLER RECIPROCATING AIR COOLED 55 TON					1.00 Ea.
Unit values	177.00	23476.50	2904.00	0.00	0.00	26380.50
Totals	177.00	\$23,477	\$2,904	\$0	\$0	\$26,381
1572014520	COIL HOT WTR 5/8" COP TUBE AL FIN 1ROW X 8FIN 12" X 24"					4.00 Ea.
Unit values	1.32	279.72	20.27	0.00	0.00	299.99
Totals	5.28	\$1,119	\$81	\$0	\$0	\$1,200
1574807504	AC&V VARI VLM MODULATING MOTORIZED DMP 8X6					20.00 Ea.

Unit values	0.53	108.89	8.83	0.00	0.00	117.72
Totals	10.66	\$2,178	\$177	\$0	\$0	\$2,355
1574807510 AC&V VARI VLM MODULATING MOTORIZED DMP 10X10						
					29.00 Ea.	
Unit values	0.62	112.89	10.19	0.00	0.00	123.08
Totals	17.84	\$3,274	\$296	\$0	\$0	\$3,570
1574807520 AC&V VARI VLM MODULATING MOTORIZED DMP 12X12						
					10.00 Ea.	
Unit values	0.67	114.89	11.04	0.00	0.00	125.93
Totals	6.67	\$1,149	\$110	\$0	\$0	\$1,259
1574807700 VARI VLM MODULATING MOTORIZED THERMST ADD						
					59.00 Ea.	
Unit values	1.00	29.47	16.64	0.00	0.00	46.11
Totals	59.00	\$1,739	\$982	\$0	\$0	\$2,721

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=====
Line #      Description
-----
      Manhours   Matl     Labor   Equipment   Sub      Total
=====
U15 MECHANICAL      673    $72,825    $10,722         $0         $0    $83,547
1633600750    SAFETY SW NF GEN DUTY 240V 3P200AMP
Unit values         6.15    185.20    95.32         0.00         4.00 Ea.
Totals              24.62     $741     $381         $0         0.00    280.52
                                $0         $0         $0         $0    $1,122

U16 ELECTRICAL      25      $741     $381         $0         $0         $0    $1,122
```

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=====
Line #      Description
-----
            Manhours   Matl     Labor   Equipment   Sub     Total
=====

ESTIMATE TOTAL      952    $76,406    $16,483        $297        $0    $93,186

SALES TAX            0.00%          $0
MATL MARKUP          0.00%          $0
LABOR MARKUP         0.00%          $0
EQUIPT MARKUP        0.00%          $0
SUB MARKUP           0.00%          $0

TOTAL BEFORE CONTINGENC $76,406    $16,483        $297        $0    $93,186
CONTINGENCY          10.00%          $9,319
BOND                 0.00%          $0
PROFIT               10.00%          $9,319

JOB TOTAL                                $111,823
```

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=====
Estimate:      BLDG  2936      Date:      02-Dec-94
Description:    RENOVATE HVAC SYSTEM COST ESTIMATE  (Replace Existing HVAC
Project:        LIMITED EEAP(HGR) Bid Date:          (EXCEPT
Location:       FORT BRAGG, N.C.  Job #:      94013.04
Sq. footage:    *****      City indx:Raleigh, NC
=====

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SUMMARY

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-----
Manhours  Matl    Labor  Equipment  Sub    Total
=====
A09 ELECTRICAL      92    $2,834    $2,013          $0    $0    $4,847
U02 SITEWORK       162          $6    $3,367    $297    $0    $3,670
U15 MECHANICAL     673    $72,825    $10,722          $0    $0    $83,547
U16 ELECTRICAL      25     $741     $381          $0    $0    $1,122

TOTAL              952    $76,406    $16,483    $297    $0    $93,186

SALES TAX           0.00%          $0
MATL MARKUP         0.00%          $0
LABOR MARKUP        0.00%          $0
EQUIPT MARKUP       0.00%          $0
SUB MARKUP          0.00%          $0

TOTAL BEFORE CONTINGENC  $76,406    $16,483    $297    $0    $93,186
CONTINGENCY         10.00%          $0
BOND                0.00%          $0
PROFIT              10.00%          $0

JOB TOTAL                                          $111,823

```

LIFE CYCLE COST ANALYSIS SUMMARY

STUDY: 3262ECO4

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) LCCID FY95 (92)

INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3

PROJECT NO. & TITLE: 94013.04 LES: ECO4 - HVAC RENOVATIONS

FISCAL YEAR 95 DISCRETE PORTION NAME: ECO

ANALYSIS DATE: 12-12-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	231472.	
B. SIOH	\$	11574.	
C. DESIGN COST	\$	11574.	
D. TOTAL COST (1A+1B+1C)	\$	254620.	
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.	
F. PUBLIC UTILITY COMPANY REBATE	\$	0.	
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$		254620.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	-65.	\$ -2279.	15.08	\$ -34363.
B. DIST	\$ 19.18	603.	\$ 11573.	18.57	\$ 214915.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	0.	\$ 0.	18.58	\$ 0.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 555.	14.88	\$ 8258.
N. TOTAL		538.	\$ 9849.		\$ 188810.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)

(1) DISCOUNT FACTOR (TABLE A)	14.88	\$	2586.
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$	38479.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-) (3A2+3Bd4) \$ 38479.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ 12435.

5. SIMPLE PAYBACK PERIOD (1G/4) 20.48 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 227288.

7. SAVINGS TO INVESTMENT RATIO (SIR) = $(6 / 1G) =$.89
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 2.42 %

=====

Estimate:	BLDG 3262	Date:	02-Dec-94
Description:	RENOVATE HVAC SYSTEM COST ESTIMATE (Fan Coil System Using		
Project:	LIMITED EEAP(HGR) Bid Date:		
Location:	FORT BRAGG, N.C.	Job #:	94013.04
Sq. footage:	*****	City indx:	Raleigh, NC

=====

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total

0913100280	FEEDER INSTALLATION, INCLUDING CONDUIT AND WIRE, 200 AMPERES					60.00 L.F.	
Unit values		0.31	9.45	6.71	0.00	0.00	16.16
Totals		18.36	\$567	\$403	\$0	\$0	\$970
A09 ELECTRICAL		19	\$567	\$403	\$0	\$0	\$970

=====						
Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
0205543200	SITE REMOVAL, STEEL PIPE, WELDED CONNECTION, 4" DIAMETER				2500.00 L.F.	
Unit values	0.15	0.00	2.61	1.06	0.00	3.68
Totals	375.00	\$0	\$6,531	\$2,659	\$0	\$9,190
0207181240	HVAC DEMO, DUCTWORK, 10" HI X 24" WIDE				800.00 L.F.	
Unit values	0.07	0.00	1.17	0.00	0.00	1.17
Totals	58.40	\$0	\$940	\$0	\$0	\$940
0207182340	HVAC DEMO, FURNACE GAS/OIL >120 MBH				1.00 Ea.	
Unit values	5.33	0.00	111.48	0.00	0.00	111.48
Totals	5.33	\$0	\$111	\$0	\$0	\$111
0207183600	HVAC DEMO, MECH EQPT HEAVY ITEM				10.00 Ton	
Unit values	14.55	0.00	314.87	0.00	0.00	314.87
Totals	145.45	\$0	\$3,149	\$0	\$0	\$3,149
0208400600	REMOVE PIPE INSULATION UP TO 4" DIAMETER PIPE				2000.00 L.F.	
Unit values	0.07	0.00	1.63	0.20	0.00	1.83
Totals	142.00	\$0	\$3,268	\$391	\$0	\$3,659
0208401000	REMOVE INSULATION FROM PIPE FITTING, UP TO 4" DIAMETER PIPE				200.00 Ea.	
Unit values	0.20	0.00	4.60	0.56	0.00	5.16
Totals	40.00	\$0	\$919	\$112	\$0	\$1,031
0222541900	TAMPING TRENCH B'FILL, VIBRATING PLATE, ADD				4.50 C.Y.	
Unit values	0.09	0.00	1.44	0.55	0.00	1.99
Totals	0.40	\$0	\$6	\$2	\$0	\$8
0222582800	TRENCH EXCVTNG 40HP CHNTRNCHR&BKFL 12"W24"D				60.00 L.F.	
Unit values	0.01	0.00	0.20	0.20	0.00	0.39
Totals	0.60	\$0	\$12	\$12	\$0	\$24
0260120200	BEDDING, FOR PIPE IN TRENCH SAND, DEAD OR BANK				1.50 C.Y.	
Unit values	0.16	3.79	2.79	1.13	0.00	7.71
Totals	0.24	\$6	\$4	\$2	\$0	\$12
0260120500	BEDDING, PLACING IN TRENCH				1.50 C.Y.	
Unit values	0.09	0.00	1.44	0.55	0.00	1.99

05-Dec-94

MeansData for Lotus

Page 3

Totals	0.13	\$0	\$2	\$1	\$0	\$3
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=====
Line #      Description
-----
      Manhours   Matl    Labor   Equipment   Sub    Total
=====
U02 SITEWORK      768        $6   $14,942   $3,179        $0   $18,127
0331305010      6" THICK REINFORCED SLAB FOR HVAC EQUIPMENT
Unit values      0.02      1.45      0.28      0.00      130.00 S.F.      1.73
Totals           3.12     $189      $36      $0      $0      $225

U03 CONCRETE       4     $189      $36      $0      $0      $225
```

=====						
Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1517010620	BLACK STEEL PIPE, SCHEDULE 40, THREADED, 2-1/2" DI W/CPLGS&HNGRS 10'OC					3000.00 L.F.
Unit values	0.32	6.64	4.93	0.00	0.00	11.57
Totals	960.00	\$19,930	\$14,792	\$0	\$0	\$34,722
1556517150	PIPE CVR FBGL 1.5"THK ASJ 2-1/2"IPS					3000.00 L.F.
Unit values	0.09	1.65	1.30	0.00	0.00	2.95
Totals	267.00	\$4,945	\$3,902	\$0	\$0	\$8,847
1556519680	PIPE CVR URTNAN ULTV ELL 1.5W 1"IPS					170.00 Ea.
Unit values	0.17	6.49	2.47	0.00	0.00	8.96
Totals	28.56	\$1,104	\$420	\$0	\$0	\$1,524
1556519840	PIPE CVR URETH UV TEE/VLV 1"W 1"IPS					80.00 Ea.
Unit values	0.24	7.79	3.54	0.00	0.00	11.33
Totals	19.36	\$623	\$283	\$0	\$0	\$906
1562408110	VALVE BUTTERFLY SYSTEM BALANCING & SHUT-OFF 2 " SIZE					80.00 Ea.
Unit values	0.73	23.48	12.40	0.00	0.00	35.88
Totals	58.16	\$1,878	\$992	\$0	\$0	\$2,870
1562450160	HVAC MIXING VALVE 2" IPS					10.00 Ea.
Unit values	1.00	889.11	17.24	0.00	0.00	906.35
Totals	10.00	\$8,891	\$172	\$0	\$0	\$9,063
1571500110	FAN COIL AIR CONDIT. CABINET MTD FLTRS CHILL WTR 3/4 TON					130.00 Ea.
Unit values	2.29	649.35	35.09	0.00	0.00	684.44
Totals	297.18	\$84,416	\$4,562	\$0	\$0	\$88,978
1571900536	WATER CHILLER RECIPROCATING AIR COOLED 55 TON					1.00 Ea.
Unit values	177.00	23476.50	2904.00	0.00	0.00	26380.50
Totals	177.00	\$23,477	\$2,904	\$0	\$0	\$26,381
U15 MECHANICAL	1818	\$145,264	\$28,027	\$0	\$0	\$173,291

```
=====
Line #      Description
-----
              Manhours   Matl      Labor   Equipment   Sub      Total
=====

1633600750   SAFETY SW NF GEN DUTY 240V 3P200AMP
Unit values      6.15      185.20      95.32      0.00      1.00 Ea.      280.52
Totals           6.15      $185        $95        $0        $0        $280

U16 ELECTRICAL      7      $185        $95        $0        $0        $280
```

```
=====
Line #      Description
-----
      Manhours  Matl    Labor  Equipment  Sub    Total
=====

ESTIMATE TOTAL      2616  $146,211  $43,503  $3,179      $0  $192,893

SALES TAX            0.00%      $0
MATL MARKUP          0.00%      $0
LABOR MARKUP         0.00%      $0
EQUIPT MARKUP        0.00%      $0
SUB MARKUP           0.00%      $0

TOTAL BEFORE CONTINGENC $146,211  $43,503  $3,179      $0  $192,893
CONTINGENCY           10.00%      $19,289
BOND                   0.00%      $0
PROFIT                 10.00%      $19,289

JOB TOTAL                                $231,472
```

```

=====
Estimate:      BLDG  3262          Date:      02-Dec-94
Description:    RENOVATE HVAC SYSTEM COST ESTIMATE  (Fan Coil System Using
Project:        LIMITED EEAP(HGR) Bid Date:
Location:       FORT BRAGG, N.C.  Job #:      94013.04
Sq. footage:    *****          City indx:Raleigh, NC
=====

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SUMMARY

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-----
Manhours  Matl  Labor  Equipment  Sub  Total
=====
A09 ELECTRICAL      19      $567      $403      $0      $0      $970
U02 SITEWORK       768        $6     $14,942     $3,179     $0     $18,127
U03 CONCRETE         4     $189      $36      $0      $0      $225
U15 MECHANICAL    1818   $145,264   $28,027      $0      $0   $173,291
U16 ELECTRICAL       7     $185      $95      $0      $0      $280

TOTAL              2616   $146,211   $43,503     $3,179     $0   $192,893

SALES TAX           0.00%      $0
MATL MARKUP         0.00%      $0
LABOR MARKUP        0.00%      $0
EQUIPT MARKUP       0.00%      $0
SUB MARKUP          0.00%      $0

TOTAL BEFORE CONTINGENC $146,211   $43,503     $3,179     $0   $192,893
CONTINGENCY          10.00%      $0
BOND                 0.00%      $0
PROFIT               10.00%      $0

JOB TOTAL                                           $231,472

```

LIFE CYCLE COST ANALYSIS SUMMARY
 ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) STUDY: 3354ECO4
 INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 LCCID FY95 (92)
 PROJECT NO. & TITLE: 94013.04 LES: ECO4 - HVAC RENOVATIONS
 FISCAL YEAR 95 DISCRETE PORTION NAME: ECO
 ANALYSIS DATE: 12-12-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	95345.		
B. SIOH	\$	4767.		
C. DESIGN COST	\$	4767.		
D. TOTAL COST (1A+1B+1C)	\$	104879.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.		
F. PUBLIC UTILITY COMPANY REBATE	\$	0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)			\$	104879.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	63.	\$ 2192.	15.08	\$ 33062.
B. DIST	\$ 19.18	-75.	\$ -1440.	18.57	\$ -26734.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	0.	\$ 0.	18.58	\$ 0.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 555.	14.88	\$ 8258.
N. TOTAL		-12.	\$ 1308.		\$ 14586.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$	4989.
(1) DISCOUNT FACTOR (TABLE A)	14.88		
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$	74234.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-) (3A2+3Bd4) \$ 74234.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ 6297.

5. SIMPLE PAYBACK PERIOD (1G/4) 16.66 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 88820.

7. SAVINGS TO INVESTMENT RATIO (SIR) = $(6 / 1G) = .85$
 (IF < 1 PROJECT DOES NOT QUALIFY)

**** Project does not qualify for ECIP funding; 4,5,6 for information only.

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): N/A

```
=====
Estimate:      BLDG  3354      Date:      29-Nov-94
Description:    RENOVATE HVAC SYSTEM COST ESTIMATE
Project:        LIMITED EEAP(HGR) Bid Date:
Location:       FORT BRAGG, N.C. Job #:      94013.04
Sq. footage:    19500          City indx:Raleigh, NC
=====
```

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0913100280	FEEDER INSTALLATION, INCLUDING CONDUIT AND WIRE, 200 AMPERES					60.00 L.F.	
Unit values		0.31	9.45	6.71	0.00	0.00	16.16
Totals		18.36	\$567	\$403	\$0	\$0	\$970
A09 ELECTRICAL		19	\$567	\$403	\$0	\$0	\$970

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0205543200	SITE REMOVAL, STEEL PIPE, WELDED CONNECTION, 4" DIAMETER					1000.00 L.F.	
Unit values	0.15	0.00	2.61	1.06	0.00		3.68
Totals	150.00	\$0	\$2,613	\$1,064	\$0		\$3,677
0207183600	HVAC DEMO, MECH EQPT HEAVY ITEM					2.00 Ton	
Unit values	14.55	0.00	314.87	0.00	0.00		314.87
Totals	29.09	\$0	\$630	\$0	\$0		\$630
0208400600	REMOVE PIPE INSULATION UP TO 4" DIAMETER PIPE					700.00 L.F.	
Unit values	0.07	0.00	1.63	0.20	0.00		1.83
Totals	49.70	\$0	\$1,144	\$137	\$0		\$1,281
0208401000	REMOVE INSULATION FROM PIPE FITTING, UP TO 4" DIAMETER PIPE					150.00 Ea.	
Unit values	0.20	0.00	4.60	0.56	0.00		5.16
Totals	30.00	\$0	\$689	\$84	\$0		\$773
0222541900	TAMPING TRENCH B'FILL, VIBRATING PLATE, ADD					4.50 C.Y.	
Unit values	0.09	0.00	1.44	0.55	0.00		1.99
Totals	0.40	\$0	\$6	\$2	\$0		\$8
0222582800	TRENCH EXCVTNG 40HP CHNTRNCHR&BKFL 12"W24"D					60.00 L.F.	
Unit values	0.01	0.00	0.20	0.20	0.00		0.39
Totals	0.60	\$0	\$12	\$12	\$0		\$24
0260120200	BEDDING, FOR PIPE IN TRENCH SAND, DEAD OR BANK					1.50 C.Y.	
Unit values	0.16	3.79	2.79	1.13	0.00		7.71
Totals	0.24	\$6	\$4	\$2	\$0		\$12
0260120500	BEDDING, PLACING IN TRENCH					1.50 C.Y.	
Unit values	0.09	0.00	1.44	0.55	0.00		1.99
Totals	0.13	\$0	\$2	\$1	\$0		\$3
U02 SITEWORK	261	\$6	\$5,100	\$1,302	\$0		\$6,408


```
=====
Line #      Description
-----
      Manhours  Matl    Labor  Equipment  Sub    Total
=====

0331305010    6" THICK REINFORCED SLAB FOR HVAC EQUIPMENT
                                130.00 S.F.
Unit values    0.02    1.45    0.28    0.00    0.00    1.73
Totals         3.12    $189    $36    $0      $0      $225

U03 CONCRETE      4    $189    $36    $0      $0      $225
```

=====						
Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1517010620	BLACK STEEL PIPE, SCHEDULE 40, THREADED, 2-1/2" DI W/CPLGS&HNGRS 10'OC					
Unit values	0.32	6.64	4.93	0.00	1200.00 L.F.	11.57
Totals	384.00	\$7,972	\$5,917	\$0	\$0	\$13,889
1556101280	HEAT TRANS PKG COMPLETE HOT WTR 180<F-200<F 15# STM 2 PUMP 130 GPM					
Unit values	48.00	17382.60	771.38	0.00	1.00 Ea.	18153.98
Totals	48.00	\$17,383	\$771	\$0	\$0	\$18,154
1556517150	PIPE CVR FBGL 1.5"THK ASJ 2-1/2"IPS					
Unit values	0.09	1.65	1.30	0.00	1200.00 L.F.	2.95
Totals	106.80	\$1,978	\$1,561	\$0	\$0	\$3,539
1556519680	PIPE CVR URTNAN ULTV ELL 1.5W 2-1/2" IPS					
Unit values	0.17	6.49	2.47	0.00	100.00 Ea.	8.96
Totals	16.80	\$649	\$247	\$0	\$0	\$896
1556519840	PIPE CVR URETH UV TEE/VLV 1.5"W 2-1/2" IPS					
Unit values	0.24	7.79	3.54	0.00	50.00 Ea.	11.33
Totals	12.10	\$390	\$177	\$0	\$0	\$567
1562408110	VALVE BUTTERFLY SYSTEM BALANCING & SHUT-OFF 2 " SIZE					
Unit values	0.73	23.48	12.40	0.00	25.00 Ea.	35.88
Totals	18.18	\$587	\$310	\$0	\$0	\$897
1562450160	HVAC MIXING VALVE 2" IPS					
Unit values	1.00	889.11	17.24	0.00	2.00 Ea.	906.35
Totals	2.00	\$1,778	\$34	\$0	\$0	\$1,812
1562600390	PRESSURE REG , HOT WTR, THRDED IRON 2" SIZE					
Unit values	0.73	339.66	12.40	0.00	1.00 Ea.	352.06
Totals	0.73	\$340	\$12	\$0	\$0	\$352
1562600990	PRESSURE REG PROCESS STM WET/SUPER THRDED IRON 2" SIZE					
Unit values	0.73	419.58	12.40	0.00	1.00 Ea.	431.98
Totals	0.73	\$420	\$12	\$0	\$0	\$432
1571500110	FAN COIL AIR CONDIT. CABINET MTD FLTRS CHILL WTR 3/4 TON					
Unit values	2.29	649.35	35.09	0.00	25.00 Ea.	684.44

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MeansData for Lotus

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Totals	57.15	\$16,234	\$877	\$0	\$0	\$17,111
1571900510	WATER CHILLER RECIPROCATING AIR COOLED 25 TON					
					1.00 Ea.	
Unit values	100.00	12287.70	1633.50	0.00	0.00	13921.20
Totals	100.00	\$12,288	\$1,634	\$0	\$0	\$13,922

```
=====
Line #      Description
-----
              Manhours  Matl    Labor  Equipment  Sub    Total
=====
U15 MECHANICAL      747    $60,019    $11,552          $0          $0    $71,571
1633600750    SAFETY SW NF GEN DUTY 240V 3P200AMP
Unit values              6.15    185.20    95.32    0.00          1.00 Ea.    280.52
Totals              6.15    $185          $95          $0          $0          $280

U16 ELECTRICAL      7      $185          $95          $0          $0          $280
=====
```

```
=====
Line #      Description
-----
      Manhours   Matl    Labor   Equipment   Sub    Total
=====
```

ESTIMATE TOTAL	1038	\$60,966	\$17,186	\$1,302	\$0	\$79,454
SALES TAX	0.00%	\$0				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$60,966	\$17,186	\$1,302	\$0	\$79,454
CONTINGENCY	10.00%					\$7,945
BOND	0.00%					\$0
PROFIT	10.00%					\$7,945
JOB TOTAL						\$95,345

```

=====
Estimate:      BLDG 3354           Date:      29-Nov-94
Description:   RENOVATE HVAC SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG, N.C.   Job #:      94013.04
Sq. footage:   19500              City indx:Raleigh, NC
=====

```

SUMMARY

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-----
Manhours      Matl      Labor      Equipment      Sub      Total
=====
A09 ELECTRICAL      19      $567      $403      $0      $0      $970
U02 SITEWORK        261      $6      $5,100      $1,302      $0      $6,408
U03 CONCRETE         4      $189      $36      $0      $0      $225
U15 MECHANICAL      747      $60,019      $11,552      $0      $0      $71,571
U16 ELECTRICAL       7      $185      $95      $0      $0      $280

TOTAL              1038      $60,966      $17,186      $1,302      $0      $79,454

SALES TAX           0.00%      $0
MATL MARKUP         0.00%      $0
LABOR MARKUP        0.00%      $0
EQUIPT MARKUP       0.00%      $0
SUB MARKUP          0.00%      $0

TOTAL BEFORE CONTINGENC $60,966      $17,186      $1,302      $0      $79,454
CONTINGENCY          10.00%      $7,945
BOND                 0.00%      $0
PROFIT               10.00%      $7,945

JOB TOTAL                                  $95,345

```

LIFE CYCLE COST ANALYSIS SUMMARY

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) STUDY: 3637ECO4
 INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3
 PROJECT NO. & TITLE: 94013.04 LES: ECO4 - HVAC RENOVATIONS
 FISCAL YEAR 95 DISCRETE PORTION NAME: ECO
 ANALYSIS DATE: 12-12-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	76979.		
B. SIOH	\$	3849.		
C. DESIGN COST	\$	3849.		
D. TOTAL COST (1A+1B+1C)	\$	84677.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.		
F. PUBLIC UTILITY COMPANY REBATE	\$	0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)			\$	84677.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	-60.	\$ -2111.	15.08	\$ -31828.
B. DIST	\$ 19.18	128.	\$ 2449.	18.57	\$ 45483.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	0.	\$ 0.	18.58	\$ 0.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 555.	14.88	\$ 8258.
N. TOTAL		67.	\$ 894.		\$ 21913.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)

(1) DISCOUNT FACTOR (TABLE A)	14.88	\$	100.
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$	1488.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-) (3A2+3Bd4) \$ 1488.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ 994.

5. SIMPLE PAYBACK PERIOD (1G/4) 85.22 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 23401.

7. SAVINGS TO INVESTMENT RATIO (SIR) = $(6 / 1G) = .28$
 (IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): -3.41 %

```
=====
Estimate:      BLDG 3637      Date:      29-Nov-94
Description:    RENOVATE HVAC SYSTEM COST ESTIMATE
Project:        LIMITED EEAP(HGR) Bid Date:
Location:       FORT BRAGG, N.C. Job #:      94013.04
Sq. footage:    12000        City indx:Raleigh, NC
=====
```

```
=====
Line #          Description
-----
              Manhours   Matl      Labor   Equipment   Sub      Total
=====
```

0913100280	FEEDER INSTALLATION, INCLUDING CONDUIT AND					
	WIRE, 200 AMPERES					
Unit values	0.31	9.45	6.71	0.00	60.00 L.F.	16.16
Totals	18.36	\$567	\$403	\$0	\$0	\$970
A09 ELECTRICAL	19	\$567	\$403	\$0	\$0	\$970

=====						
Line #	Description					
		Manhours	Matl	Labor	Equipment	Sub
=====						
0205543200	SITE REMOVAL, STEEL PIPE, WELDED CONNECTION, 4" DIAMETER					700.00 L.F.
Unit values		0.15	0.00	2.61	1.06	0.00
Totals		105.00	\$0	\$1,829	\$745	\$0
						\$2,574
0207183600	HVAC DEMO, MECH EQPT HEAVY ITEM					1.00 Ton
Unit values		14.55	0.00	314.87	0.00	0.00
Totals		14.55	\$0	\$315	\$0	\$0
						\$315
0208400600	REMOVE PIPE INSULATION UP TO 4" DIAMETER PIPE					500.00 L.F.
Unit values		0.07	0.00	1.63	0.20	0.00
Totals		35.50	\$0	\$817	\$98	\$0
						\$915
0208401000	REMOVE INSULATION FROM PIPE FITTING, UP TO 4" DIAMETER PIPE					100.00 Ea.
Unit values		0.20	0.00	4.60	0.56	0.00
Totals		20.00	\$0	\$460	\$56	\$0
						\$516
0222541900	TAMPING TRENCH B'FILL, VIBRATING PLATE, ADD					4.50 C.Y.
Unit values		0.09	0.00	1.44	0.55	0.00
Totals		0.40	\$0	\$6	\$2	\$0
						\$8
0222582800	TRENCH EXCVTNG 40HP CHNTRNCHR&BKFL 12"W24"D					60.00 L.F.
Unit values		0.01	0.00	0.20	0.20	0.00
Totals		0.60	\$0	\$12	\$12	\$0
						\$24
0260120200	BEDDING, FOR PIPE IN TRENCH SAND, DEAD OR BANK					1.50 C.Y.
Unit values		0.16	3.79	2.79	1.13	0.00
Totals		0.24	\$6	\$4	\$2	\$0
						\$7.71
						\$12
0260120500	BEDDING, PLACING IN TRENCH					1.50 C.Y.
Unit values		0.09	0.00	1.44	0.55	0.00
Totals		0.13	\$0	\$2	\$1	\$0
						\$1.99
						\$3
U02 SITEWORK		177	\$6	\$3,445	\$916	\$0
						\$4,367

```
=====
Line #      Description
-----
              Manhours   Matl      Labor   Equipment   Sub      Total
=====

0331305010   6" THICK REINFORCED SLAB FOR HVAC EQUIPMENT
                                110.00 S.F.
Unit values    0.02      1.45      0.28      0.00      0.00      1.73
Totals         2.64     $160      $31       $0       $0       $191

U03 CONCRETE      3      $160      $31       $0       $0       $191
```

=====						
Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1517010620	BLACK STEEL PIPE, SCHEDULE 40, THREADED, 2-1/2" DI W/CPLGS&HNRS 10' OC					900.00 L.F.
Unit values	0.32	6.64	4.93	0.00	0.00	11.57
Totals	288.00	\$5,979	\$4,438	\$0	\$0	\$10,417
1556101280	HEAT TRANS PKG COMPLETE HOT WTR 180<F-200<F 15# STM 2 PUMP 130 GPM					1.00 Ea.
Unit values	48.00	17382.60	771.38	0.00	0.00	18153.98
Totals	48.00	\$17,383	\$771	\$0	\$0	\$18,154
1556517150	PIPE CVR FBGL 1.5"THK ASJ 2-1/2"IPS					900.00 L.F.
Unit values	0.09	1.65	1.30	0.00	0.00	2.95
Totals	80.10	\$1,484	\$1,171	\$0	\$0	\$2,655
1556519680	PIPE CVR URTHAN ULTV ELL 1.5W 2-1/2" IPS					60.00 Ea.
Unit values	0.17	6.49	2.47	0.00	0.00	8.96
Totals	10.08	\$390	\$148	\$0	\$0	\$538
1556519840	PIPE CVR URETH UV TEE/VLV 1.5"W 2-1/2" IPS					40.00 Ea.
Unit values	0.24	7.79	3.54	0.00	0.00	11.33
Totals	9.68	\$312	\$142	\$0	\$0	\$454
1562408110	VALVE BUTTERFLY SYSTEM BALANCING & SHUT-OFF 2 " SIZE					15.00 Ea.
Unit values	0.73	23.48	12.40	0.00	0.00	35.88
Totals	10.91	\$352	\$186	\$0	\$0	\$538
1562450160	HVAC MIXING VALVE 2" IPS					2.00 Ea.
Unit values	1.00	889.11	17.24	0.00	0.00	906.35
Totals	2.00	\$1,778	\$34	\$0	\$0	\$1,812
1562600390	PRESSURE REG , HOT WTR, THRD ED IRON 2" SIZE					1.00 Ea.
Unit values	0.73	339.66	12.40	0.00	0.00	352.06
Totals	0.73	\$340	\$12	\$0	\$0	\$352
1562600990	PRESSURE REG PROCESS STM WET/SUPER THRD ED IRON 2" SIZE					1.00 Ea.
Unit values	0.73	419.58	12.40	0.00	0.00	431.98
Totals	0.73	\$420	\$12	\$0	\$0	\$432
1571500110	FAN COIL AIR CONDIT. CABINET MTD FLTRS CHILL WTR 3/4 TON					15.00 Ea.
Unit values	2.29	649.35	35.09	0.00	0.00	684.44

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MeansData for Lotus

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Totals	34.29	\$9,740	\$526	\$0	\$0	\$10,266
1571900510	WATER CHILLER RECIPROCATING AIR COOLED 15 TON					
					1.00 Ea.	
Unit values	100.00	11088.90	1633.50	0.00	0.00	12722.40
Totals	100.00	\$11,089	\$1,634	\$0	\$0	\$12,723

12-Dec-94

MeansData for Lotus

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```
=====
Line #      Description
-----
            Manhours   Matl     Labor   Equipment   Sub      Total
=====
U15 MECHANICAL      585    $49,267    $9,074         $0         $0    $58,341
1633600750    SAFETY SW NF GEN DUTY 240V 3P200AMP
Unit values        6.15    185.20    95.32     0.00        1.00 Ea. 280.52
Totals             6.15     $185     $95         $0         $0      $280

U16 ELECTRICAL       7      $185      $95         $0         $0      $280
```

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MeansData for Lotus

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```
=====
Line #      Description
-----
           Manhours   Matl     Labor   Equipment   Sub     Total
=====
```

ESTIMATE TOTAL	791	\$50,185	\$13,048	\$916	\$0	\$64,149
SALES TAX	0.00%	\$0				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$50,185	\$13,048	\$916	\$0	\$64,149
CONTINGENCY	10.00%					\$6,415
BOND	0.00%					\$0
PROFIT	10.00%					\$6,415
JOB TOTAL						\$76,979

```

=====
Estimate:      BLDG  3637          Date:      29-Nov-94
Description:   RENOVATE HVAC SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG, N.C.  Job #:      94013.04
Sq. footage:   12000             City indx:Raleigh, NC
=====

```

SUMMARY

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-----
Manhours  Matl  Labor  Equipment  Sub  Total
=====
A09 ELECTRICAL      19      $567      $403          $0      $0      $970
U02 SITEWORK       177        $6     $3,445     $916      $0     $4,367
U03 CONCRETE        3      $160        $31        $0      $0      $191
U15 MECHANICAL     585    $49,267     $9,074        $0      $0     $58,341
U16 ELECTRICAL      7      $185        $95         $0      $0      $280

TOTAL              791    $50,185     $13,048     $916      $0     $64,149

SALES TAX           0.00%        $0
MATL MARKUP         0.00%        $0
LABOR MARKUP        0.00%          $0
EQUIPT MARKUP       0.00%         $0
SUB MARKUP          0.00%          $0

TOTAL BEFORE CONTINGENC $50,185     $13,048     $916      $0     $64,149
CONTINGENCY          10.00%          $6,415
BOND                  0.00%          $0
PROFIT                10.00%          $6,415

JOB TOTAL                                     $76,979

```

LIFE CYCLE COST ANALYSIS SUMMARY

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) STUDY: 3642ECO4
 INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3
 PROJECT NO. & TITLE: 94013.04 LES: ECO4 - HVAC RENOVATIONS
 FISCAL YEAR 95 DISCRETE PORTION NAME: ECO
 ANALYSIS DATE: 12-12-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	95345.	
B. SIOH	\$	4767.	
C. DESIGN COST	\$	4767.	
D. TOTAL COST (1A+1B+1C)	\$	104879.	
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.	
F. PUBLIC UTILITY COMPANY REBATE	\$	0.	
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$		104879.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	50.	\$ 1730.	15.08	\$ 26089.
B. DIST	\$ 19.18	-62.	\$ -1198.	18.57	\$ -22247.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	0.	\$ 0.	18.58	\$ 0.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 555.	14.88	\$ 8258.
N. TOTAL		-13.	\$ 1087.		\$ 12101.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)

(1) DISCOUNT FACTOR (TABLE A)	14.88	\$ 843.
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$ 12545.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+) COST(-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-) (3A2+3Bd4) \$ 12545.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ 1930.

5. SIMPLE PAYBACK PERIOD (1G/4) 54.34 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 24646.

7. SAVINGS TO INVESTMENT RATIO (SIR) = $(6 / 1G) = .23$
 (IF < 1 PROJECT DOES NOT QUALIFY)

**** Project does not qualify for ECIP funding; 4,5,6 for information only.

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): N/A


```

=====
Estimate:      BLDG 3642           Date:      29-Nov-94
Description:    RENOVATE HVAC SYSTEM COST ESTIMATE
Project:        LIMITED EEAP(HGR) Bid Date:
Location:       FORT BRAGG, N.C.  Job #:      94013.04
Sq. footage:    19500             City indx:Raleigh, NC
=====

```

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0913100280	FEEDER INSTALLATION, INCLUDING CONDUIT AND WIRE, 200 AMPERES					60.00 L.F.	
Unit values		0.31	9.45	6.71	0.00	0.00	16.16
Totals		18.36	\$567	\$403	\$0	\$0	\$970
A09 ELECTRICAL		19	\$567	\$403	\$0	\$0	\$970

=====							
Line #	Description						

	Manhours	Matl	Labor	Equipment	Sub	Total	
=====							
0205543200	SITE REMOVAL, STEEL PIPE, WELDED CONNECTION, 4" DIAMETER					1000.00 L.F.	
Unit values	0.15	0.00	2.61	1.06	0.00	3.68	
Totals	150.00	\$0	\$2,613	\$1,064	\$0	\$3,677	
0207183600	HVAC DEMO, MECH EQPT HEAVY ITEM					2.00 Ton	
Unit values	14.55	0.00	314.87	0.00	0.00	314.87	
Totals	29.09	\$0	\$630	\$0	\$0	\$630	
0208400600	REMOVE PIPE INSULATION UP TO 4" DIAMETER PIPE					700.00 L.F.	
Unit values	0.07	0.00	1.63	0.20	0.00	1.83	
Totals	49.70	\$0	\$1,144	\$137	\$0	\$1,281	
0208401000	REMOVE INSULATION FROM PIPE FITTING, UP TO 4" DIAMETER PIPE					150.00 Ea.	
Unit values	0.20	0.00	4.60	0.56	0.00	5.16	
Totals	30.00	\$0	\$689	\$84	\$0	\$773	
0222541900	TAMPING TRENCH B'FILL, VIBRATING PLATE, ADD					4.50 C.Y.	
Unit values	0.09	0.00	1.44	0.55	0.00	1.99	
Totals	0.40	\$0	\$6	\$2	\$0	\$8	
0222582800	TRENCH EXCVTNG 40HP CHNTRNCHR&BKFL 12"W24"D					60.00 L.F.	
Unit values	0.01	0.00	0.20	0.20	0.00	0.39	
Totals	0.60	\$0	\$12	\$12	\$0	\$24	
0260120200	BEDDING, FOR PIPE IN TRENCH SAND, DEAD OR BANK					1.50 C.Y.	
Unit values	0.16	3.79	2.79	1.13	0.00	7.71	
Totals	0.24	\$6	\$4	\$2	\$0	\$12	
0260120500	BEDDING, PLACING IN TRENCH					1.50 C.Y.	
Unit values	0.09	0.00	1.44	0.55	0.00	1.99	
Totals	0.13	\$0	\$2	\$1	\$0	\$3	
U02 SITEWORK	261	\$6	\$5,100	\$1,302	\$0	\$6,408	

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=====
Line #      Description
-----
            Manhours  Matl    Labor  Equipment  Sub      Total
=====

0331305010    6" THICK REINFORCED SLAB FOR HVAC EQUIPMENT
                                130.00 S.F.
Unit values    0.02      1.45      0.28      0.00      0.00      1.73
Totals         3.12     $189      $36       $0       $0      $225

U03 CONCRETE      4      $189      $36       $0       $0      $225
```

=====						
Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1517010620	BLACK STEEL PIPE, SCHEDULE 40, THREADED, 2-1/2" DI W/CPLGS&HNGRS 10'OC					
Unit values	0.32	6.64	4.93	0.00	1200.00 L.F.	11.57
Totals	384.00	\$7,972	\$5,917	\$0	\$0	\$13,889
1556101280	HEAT TRANS PKG COMPLETE HOT WTR 180<F-200<F 15# STM 2 PUMP 130 GPM					
Unit values	48.00	17382.60	771.38	0.00	1.00 Ea.	18153.98
Totals	48.00	\$17,383	\$771	\$0	\$0	\$18,154
1556517150	PIPE CVR FBGL 1.5"THK ASJ 2-1/2"IPS					
Unit values	0.09	1.65	1.30	0.00	1200.00 L.F.	2.95
Totals	106.80	\$1,978	\$1,561	\$0	\$0	\$3,539
1556519680	PIPE CVR URTNAN ULTV ELL 1.5W 2-1/2" IPS					
Unit values	0.17	6.49	2.47	0.00	100.00 Ea.	8.96
Totals	16.80	\$649	\$247	\$0	\$0	\$896
1556519840	PIPE CVR URETH UV TEE/VLV 1.5"W 2-1/2" IPS					
Unit values	0.24	7.79	3.54	0.00	50.00 Ea.	11.33
Totals	12.10	\$390	\$177	\$0	\$0	\$567
1562408110	VALVE BUTTERFLY SYSTEM BALANCING & SHUT-OFF 2 " SIZE					
Unit values	0.73	23.48	12.40	0.00	25.00 Ea.	35.88
Totals	18.18	\$587	\$310	\$0	\$0	\$897
1562450160	HVAC MIXING VALVE 2" IPS					
Unit values	1.00	889.11	17.24	0.00	2.00 Ea.	906.35
Totals	2.00	\$1,778	\$34	\$0	\$0	\$1,812
1562600390	PRESSURE REG , HOT WTR, THRDDED IRON 2" SIZE					
Unit values	0.73	339.66	12.40	0.00	1.00 Ea.	352.06
Totals	0.73	\$340	\$12	\$0	\$0	\$352
1562600990	PRESSURE REG PROCESS STM WET/SUPER THRDDED IRON 2" SIZE					
Unit values	0.73	419.58	12.40	0.00	1.00 Ea.	431.98
Totals	0.73	\$420	\$12	\$0	\$0	\$432
1571500110	FAN COIL AIR CONDIT. CABINET MTD FLTRS CHILL WTR 3/4 TON					
Unit values	2.29	649.35	35.09	0.00	25.00 Ea.	684.44

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Totals	57.15	\$16,234	\$877	\$0	\$0	\$17,111
1571900510	WATER CHILLER RECIPROCATING AIR COOLED 25 TON					
					1.00 Ea.	
Unit values	100.00	12287.70	1633.50	0.00	0.00	13921.20
Totals	100.00	\$12,288	\$1,634	\$0	\$0	\$13,922

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=====
Line #      Description
-----
              Manhours   Matl      Labor   Equipment   Sub      Total
=====
U15 MECHANICAL      747    $60,019    $11,552         $0         $0    $71,571
1633600750    SAFETY SW NF GEN DUTY 240V 3P200AMP
Unit values      6.15    185.20    95.32      0.00      1.00 Ea.    280.52
Totals           6.15     $185      $95         $0         $0         $280

U16 ELECTRICAL      7      $185      $95         $0         $0         $280
```

```
=====
Line #      Description
-----
            Manhours   Matl      Labor    Equipment   Sub      Total
=====

ESTIMATE TOTAL      1038      $60,966    $17,186    $1,302           $0      $79,454

SALES TAX            0.00%           $0
MATL MARKUP          0.00%           $0
LABOR MARKUP         0.00%           $0
EQUIPT MARKUP        0.00%           $0
SUB MARKUP           0.00%           $0

TOTAL BEFORE CONTINGENC $60,966    $17,186    $1,302           $0      $79,454
CONTINGENCY          10.00%           $7,945
BOND                  0.00%           $0
PROFIT                10.00%           $7,945

JOB TOTAL                                     $95,345
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=====
Estimate:      BLDG 3642          Date:      29-Nov-94
Description:   RENOVATE HVAC SYSTEM COST ESTIMATE
Project:      LIMITED EEAP(HGR) Bid Date:
Location:     FORT BRAGG, N.C.  Job #:      94013.04
Sq. footage:  19500             City indx:Raleigh, NC
=====

```

SUMMARY

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-----
Manhours  Matl  Labor  Equipment  Sub  Total
=====
A09 ELECTRICAL      19      $567      $403      $0      $0      $970
U02 SITEWORK       261        $6     $5,100     $1,302      $0     $6,408
U03 CONCRETE        4      $189      $36      $0      $0      $225
U15 MECHANICAL     747    $60,019    $11,552      $0      $0    $71,571
U16 ELECTRICAL      7      $185      $95      $0      $0      $280

TOTAL              1038    $60,966    $17,186    $1,302      $0    $79,454

SALES TAX          0.00%      $0
MATL MARKUP        0.00%      $0
LABOR MARKUP       0.00%      $0
EQUIPT MARKUP      0.00%      $0
SUB MARKUP         0.00%      $0

TOTAL BEFORE CONTINGENC $60,966    $17,186    $1,302      $0    $79,454
CONTINGENCY         10.00%      $7,945
BOND                0.00%      $0
PROFIT              10.00%      $7,945

JOB TOTAL                                           $95,345

```


LIFE CYCLE COST ANALYSIS SUMMARY
 ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)
 INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 CENSUS: 3
 PROJECT NO. & TITLE: 94013.04 LES: ECO4 - HVAC RENOVATIONS
 FISCAL YEAR 95 DISCRETE PORTION NAME: ECO
 ANALYSIS DATE: 12-13-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	95345.	
B. SIOH	\$	4767.	
C. DESIGN COST	\$	4767.	
D. TOTAL COST (1A+1B+1C)	\$	104879.	
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.	
F. PUBLIC UTILITY COMPANY REBATE	\$	0.	
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$		104879.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH (1)	SAVINGS MWH/YR (2)	ANNUAL \$ SAVINGS (3)	DISCOUNT FACTOR (4)	DISCOUNTED SAVINGS (5)
A. ELECT	\$ 34.95	-62.	\$ -2174.	15.08	\$ -32777.
B. DIST	\$ 19.18	373.	\$ 7163.	18.57	\$ 133016.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	0.	\$ 0.	18.58	\$ 0.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 555.	14.88	\$ 8258.
N. TOTAL		311.	\$ 5544.		\$ 108498.

3. NON ENERGY SAVINGS (+) / COST (-)

A. ANNUAL RECURRING (+/-)		\$	4750.
(1) DISCOUNT FACTOR (TABLE A)	14.88		
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$	70684.

B. NON RECURRING SAVINGS (+) / COSTS (-)

ITEM	SAVINGS (+) COST (-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS (+) / COST (-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS (+) / COST (-) (3A2+3Bd4) \$ 70684.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS \text{ ECONOMIC LIFE}))$ \$ 10295.

5. SIMPLE PAYBACK PERIOD (1G/4) 10.19 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 179182.

7. SAVINGS TO INVESTMENT RATIO (SIR) = (6 / 1G) = 1.71
 (IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 5.80 %

```

=====
Estimate:      BLDG 3962          Date:      29-Nov-94
Description:    RENOVATE HVAC SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG, N.C.  Job #:      94013.04
Sq. footage:   19500             City indx:Raleigh, NC
=====

```

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0913100280	FEEDER INSTALLATION, INCLUDING CONDUIT AND WIRE, 200 AMPERES					60.00 L.F.	
Unit values		0.31	9.45	6.71	0.00	0.00	16.16
Totals		18.36	\$567	\$403	\$0	\$0	\$970
A09 ELECTRICAL		19	\$567	\$403	\$0	\$0	\$970

=====							
Line #	Description						

	Manhours	Matl	Labor	Equipment	Sub	Total	
=====							
0205543200	SITE REMOVAL, STEEL PIPE, WELDED CONNECTION, 4"DIAMETER					1000.00 L.F.	
Unit values	0.15	0.00	2.61	1.06	0.00	3.68	
Totals	150.00	\$0	\$2,613	\$1,064	\$0	\$3,677	
0207183600	HVAC DEMO, MECH EQPT HEAVY ITEM					2.00 Ton	
Unit values	14.55	0.00	314.87	0.00	0.00	314.87	
Totals	29.09	\$0	\$630	\$0	\$0	\$630	
0208400600	REMOVE PIPE INSULATION UP TO 4" DIAMETER PIPE					700.00 L.F.	
Unit values	0.07	0.00	1.63	0.20	0.00	1.83	
Totals	49.70	\$0	\$1,144	\$137	\$0	\$1,281	
0208401000	REMOVE INSULATION FROM PIPE FITTING, UP TO 4" DIAMETER PIPE					150.00 Ea.	
Unit values	0.20	0.00	4.60	0.56	0.00	5.16	
Totals	30.00	\$0	\$689	\$84	\$0	\$773	
0222541900	TAMPING TRENCH B'FILL, VIBRATING PLATE, ADD					4.50 C.Y.	
Unit values	0.09	0.00	1.44	0.55	0.00	1.99	
Totals	0.40	\$0	\$6	\$2	\$0	\$8	
0222582800	TRENCH EXCVTNG 40HP CHNTRNCHR&BKFL 12"W24"D					60.00 L.F.	
Unit values	0.01	0.00	0.20	0.20	0.00	0.39	
Totals	0.60	\$0	\$12	\$12	\$0	\$24	
0260120200	BEDDING, FOR PIPE IN TRENCH SAND, DEAD OR BANK					1.50 C.Y.	
Unit values	0.16	3.79	2.79	1.13	0.00	7.71	
Totals	0.24	\$6	\$4	\$2	\$0	\$12	
0260120500	BEDDING, PLACING IN TRENCH					1.50 C.Y.	
Unit values	0.09	0.00	1.44	0.55	0.00	1.99	
Totals	0.13	\$0	\$2	\$1	\$0	\$3	
U02 SITEWORK	261	\$6	\$5,100	\$1,302	\$0	\$6,408	

```
=====
Line #      Description
-----
           Manhours  Matl    Labor  Equipment  Sub    Total
=====
```

0331305010 6" THICK REINFORCED SLAB FOR HVAC EQUIPMENT

Unit values	0.02	1.45	0.28	0.00	130.00 S.F.	
Totals	3.12	\$189	\$36	\$0	\$0	1.73 \$225

U03 CONCRETE	4	\$189	\$36	\$0	\$0	\$225
--------------	---	-------	------	-----	-----	-------

=====						
Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1517010620	BLACK STEEL PIPE, SCHEDULE 40, THREADED, 2-1/2" DI W/CPLGS&HNGRS 10'OC					
					1200.00	L.F.
Unit values	0.32	6.64	4.93	0.00	0.00	11.57
Totals	384.00	\$7,972	\$5,917	\$0	\$0	\$13,889
1556101280	HEAT TRANS PKG COMPLETE HOT WTR 180<F-200<F 15# STM 2 PUMP 130 GPM					
					1.00	Ea.
Unit values	48.00	17382.60	771.38	0.00	0.00	18153.98
Totals	48.00	\$17,383	\$771	\$0	\$0	\$18,154
1556517150	PIPE CVR FBGL 1.5"THK ASJ 2-1/2"IPS					
					1200.00	L.F.
Unit values	0.09	1.65	1.30	0.00	0.00	2.95
Totals	106.80	\$1,978	\$1,561	\$0	\$0	\$3,539
1556519680	PIPE CVR URTNAN ULTV ELL 1.5W 2-1/2" IPS					
					100.00	Ea.
Unit values	0.17	6.49	2.47	0.00	0.00	8.96
Totals	16.80	\$649	\$247	\$0	\$0	\$896
1556519840	PIPE CVR URETH UV TEE/VLV 1.5"W 2-1/2" IPS					
					50.00	Ea.
Unit values	0.24	7.79	3.54	0.00	0.00	11.33
Totals	12.10	\$390	\$177	\$0	\$0	\$567
1562408110	VALVE BUTTERFLY SYSTEM BALANCING & SHUT-OFF 2 " SIZE					
					25.00	Ea.
Unit values	0.73	23.48	12.40	0.00	0.00	35.88
Totals	18.18	\$587	\$310	\$0	\$0	\$897
1562450160	HVAC MIXING VALVE 2" IPS					
					2.00	Ea.
Unit values	1.00	889.11	17.24	0.00	0.00	906.35
Totals	2.00	\$1,778	\$34	\$0	\$0	\$1,812
1562600390	PRESSURE REG , HOT WTR, THRDDED IRON 2" SIZE					
					1.00	Ea.
Unit values	0.73	339.66	12.40	0.00	0.00	352.06
Totals	0.73	\$340	\$12	\$0	\$0	\$352
1562600990	PRESSURE REG PROCESS STM WET/SUPER THRDDED IRON 2" SIZE					
					1.00	Ea.
Unit values	0.73	419.58	12.40	0.00	0.00	431.98
Totals	0.73	\$420	\$12	\$0	\$0	\$432
1571500110	FAN COIL AIR CONDIT. CABINET MTD FLTRS CHILL WTR 3/4 TON					
					25.00	Ea.
Unit values	2.29	649.35	35.09	0.00	0.00	684.44

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MeansData for Lotus

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Totals	57.15	\$16,234	\$877	\$0	\$0	\$17,111
1571900510	WATER CHILLER RECIPROCATING AIR COOLED 25 TON					
					1.00 Ea.	
Unit values	100.00	12287.70	1633.50	0.00	0.00	13921.20
Totals	100.00	\$12,288	\$1,634	\$0	\$0	\$13,922

```
=====
Line #      Description
-----
              Manhours   Matl     Labor   Equipment   Sub      Total
=====
U15 MECHANICAL      747    $60,019   $11,552         $0         $0    $71,571
1633600750    SAFETY SW NF GEN DUTY 240V 3P200AMP
Unit values        6.15    185.20    95.32     0.00         1.00 Ea.  280.52
Totals             6.15     $185     $95        $0         $0        $280

U16 ELECTRICAL       7      $185     $95        $0         $0        $280
```

```
=====
Line #      Description
-----
              Manhours   Matl      Labor    Equipment   Sub      Total
=====
```

ESTIMATE TOTAL	1038	\$60,966	\$17,186	\$1,302	\$0	\$79,454
SALES TAX	0.00%	\$0				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$60,966	\$17,186	\$1,302	\$0	\$79,454
CONTINGENCY	10.00%					\$7,945
BOND	0.00%					\$0
PROFIT	10.00%					\$7,945
JOB TOTAL						\$95,345


```

=====
Estimate:      BLDG 3962      Date:      29-Nov-94
Description:    RENOVATE HVAC SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG, N.C. Job #:      94013.04
Sq. footage:   19500        City indx:Raleigh, NC
=====

```

SUMMARY

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-----
              Manhours   Matl      Labor   Equipment   Sub      Total
=====
A09 ELECTRICAL      19      $567      $403      $0      $0      $970
U02 SITEWORK       261        $6      $5,100    $1,302      $0      $6,408
U03 CONCRETE        4      $189      $36      $0      $0      $225
U15 MECHANICAL     747    $60,019    $11,552      $0      $0      $71,571
U16 ELECTRICAL      7      $185      $95      $0      $0      $280

TOTAL              1038    $60,966    $17,186    $1,302      $0      $79,454

SALES TAX           0.00%      $0
MATL MARKUP         0.00%      $0
LABOR MARKUP        0.00%      $0
EQUIPT MARKUP       0.00%      $0
SUB MARKUP          0.00%      $0

TOTAL BEFORE CONTINGENC $60,966    $17,186    $1,302      $0      $79,454
CONTINGENCY         10.00%      $7,945
BOND                0.00%      $0
PROFIT              10.00%      $7,945

JOB TOTAL                                          $95,345

```

LIFE CYCLE COST ANALYSIS SUMMARY
 ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) STUDY: 4137ECO4
 INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 LCCID FY95 (92)
 PROJECT NO. & TITLE: 94013.04 LES: ECO4 - HVAC RENOVATIONS
 FISCAL YEAR 95 DISCRETE PORTION NAME: ECO
 ANALYSIS DATE: 12-12-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	76979.		
B. SIOH	\$	3849.		
C. DESIGN COST	\$	3849.		
D. TOTAL COST (1A+1B+1C)	\$	84677.		
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.		
F. PUBLIC UTILITY COMPANY REBATE	\$	0.		
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$		84677.	

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	-61.	\$ -2128.	15.08	\$ -32087.
B. DIST	\$ 19.18	133.	\$ 2552.	18.57	\$ 47399.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	0.	\$ 0.	18.58	\$ 0.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 555.	14.88	\$ 8258.
N. TOTAL		72.	\$ 980.		\$ 23571.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)
 (1) DISCOUNT FACTOR (TABLE A) 14.88
 (2) DISCOUNTED SAVING/COST (3A X 3A1) \$ 19923.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+) COST(-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-) (3A2+3Bd4) \$ 19923.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS\ ECONOMIC\ LIFE))$ \$ 2319.

5. SIMPLE PAYBACK PERIOD (1G/4) 36.52 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 43494.

7. SAVINGS TO INVESTMENT RATIO (SIR)=(6 / 1G)= .51
 (IF < 1 PROJECT DOES NOT QUALIFY)

**** Project does not qualify for ECIP funding; 4,5,6 for information only.

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): N/A

```

=====
Estimate:      BLDG 4137          Date:      29-Nov-94
Description:    RENOVATE HVAC SYSTEM COST ESTIMATE
Project:        LIMITED EEAP(HGR) Bid Date:
Location:       FORT BRAGG, N.C.  Job #:      94013.04
Sq. footage:    12000           City indx:Raleigh, NC
=====

```

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0913100280	FEEDER INSTALLATION, INCLUDING CONDUIT AND WIRE, 200 AMPERES					60.00 L.F.	
Unit values		0.31	9.45	6.71	0.00	0.00	16.16
Totals		18.36	\$567	\$403	\$0	\$0	\$970
A09 ELECTRICAL		19	\$567	\$403	\$0	\$0	\$970

```

=====
Line #      Description
-----
Manhours   Matl      Labor    Equipment   Sub      Total
=====

0205543200  SITE REMOVAL, STEEL PIPE, WELDED CONNECTION,
              4" DIAMETER                                700.00 L.F.
Unit values      0.15      0.00      2.61      1.06      0.00      3.68
Totals          105.00      $0      $1,829      $745      $0      $2,574

0207183600  HVAC DEMO, MECH EQPT HEAVY ITEM
Unit values      14.55      0.00     314.87      0.00      0.00     314.87
Totals          14.55      $0      $315      $0      $0      $315

0208400600  REMOVE PIPE INSULATION UP TO 4" DIAMETER PIPE
Unit values      0.07      0.00      1.63      0.20      500.00 L.F.      1.83
Totals          35.50      $0      $817      $98      0.00      $915

0208401000  REMOVE INSULATION FROM PIPE FITTING, UP TO 4"
              DIAMETER PIPE                                100.00 Ea.
Unit values      0.20      0.00      4.60      0.56      0.00      5.16
Totals          20.00      $0      $460      $56      $0      $516

0222541900  TAMPING TRENCH B'FILL, VIBRATING PLATE, ADD
Unit values      0.09      0.00      1.44      0.55      4.50 C.Y.      1.99
Totals          0.40      $0      $6      $2      0.00      $8

0222582800  TRENCH EXCVTNG 40HP CHNTRNCHR&BKFL 12"W24"D
Unit values      0.01      0.00      0.20      0.20      60.00 L.F.      0.39
Totals          0.60      $0      $12      $12      0.00      $24

0260120200  BEDDING, FOR PIPE IN TRENCH SAND, DEAD OR
              BANK
Unit values      0.16      3.79      2.79      1.13      1.50 C.Y.      7.71
Totals          0.24      $6      $4      $2      0.00      $12

0260120500  BEDDING, PLACING IN TRENCH
Unit values      0.09      0.00      1.44      0.55      1.50 C.Y.      1.99
Totals          0.13      $0      $2      $1      0.00      $3

U02 SITEWORK      177      $6      $3,445      $916      $0      $4,367

```

```
=====
Line #      Description
-----
              Manhours  Matl    Labor  Equipment  Sub      Total
=====

0331305010    6" THICK REINFORCED SLAB FOR HVAC EQUIPMENT
              0.02      1.45    0.28    0.00      110.00 S.F.
Unit values    0.02      1.45    0.28    0.00      0.00      1.73
Totals         2.64     $160    $31     $0        $0        $191

U03 CONCRETE      3      $160    $31     $0        $0        $191
```

=====						
Line #	Description					
	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1517010620	BLACK STEEL PIPE, SCHEDULE 40, THREADED, 2-1/2" DI W/CPLGS&HNGRS 10'OC					
Unit values	0.32	6.64	4.93	0.00	900.00 L.F.	11.57
Totals	288.00	\$5,979	\$4,438	\$0	\$0	\$10,417
1556101280	HEAT TRANS PKG COMPLETE HOT WTR 180<F-200<F 15# STM 2 PUMP 130 GPM					
Unit values	48.00	17382.60	771.38	0.00	1.00 Ea.	18153.98
Totals	48.00	\$17,383	\$771	\$0	\$0	\$18,154
1556517150	PIPE CVR FBGL 1.5"THK ASJ 2-1/2"IPS					
Unit values	0.09	1.65	1.30	0.00	900.00 L.F.	2.95
Totals	80.10	\$1,484	\$1,171	\$0	\$0	\$2,655
1556519680	PIPE CVR URTAN ULTV ELL 1.5W 2-1/2" IPS					
Unit values	0.17	6.49	2.47	0.00	60.00 Ea.	8.96
Totals	10.08	\$390	\$148	\$0	\$0	\$538
1556519840	PIPE CVR URETH UV TEE/VLV 1.5"W 2-1/2" IPS					
Unit values	0.24	7.79	3.54	0.00	40.00 Ea.	11.33
Totals	9.68	\$312	\$142	\$0	\$0	\$454
1562408110	VALVE BUTTERFLY SYSTEM BALANCING & SHUT-OFF 2 " SIZE					
Unit values	0.73	23.48	12.40	0.00	15.00 Ea.	35.88
Totals	10.91	\$352	\$186	\$0	\$0	\$538
1562450160	HVAC MIXING VALVE 2" IPS					
Unit values	1.00	889.11	17.24	0.00	2.00 Ea.	906.35
Totals	2.00	\$1,778	\$34	\$0	\$0	\$1,812
1562600390	PRESSURE REG , HOT WTR, THRD ED IRON 2" SIZE					
Unit values	0.73	339.66	12.40	0.00	1.00 Ea.	352.06
Totals	0.73	\$340	\$12	\$0	\$0	\$352
1562600990	PRESSURE REG PROCESS STM WET/SUPER THRD ED IRON 2" SIZE					
Unit values	0.73	419.58	12.40	0.00	1.00 Ea.	431.98
Totals	0.73	\$420	\$12	\$0	\$0	\$432
1571500110	FAN COIL AIR CONDIT. CABINET MTD FLTRS CHILL WTR 3/4 TON					
Unit values	2.29	649.35	35.09	0.00	15.00 Ea.	684.44

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MeansData for Lotus

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Totals	34.29	\$9,740	\$526	\$0	\$0	\$10,266
1571900510	WATER CHILLER RECIPROCATING AIR COOLED 15 TON					
					1.00 Ea.	
Unit values	100.00	11088.90	1633.50	0.00	0.00	12722.40
Totals	100.00	\$11,089	\$1,634	\$0	\$0	\$12,723

```
=====
Line #      Description
-----
      Manhours   Matl     Labor   Equipment   Sub     Total
=====
U15 MECHANICAL      585    $49,267    $9,074         $0         $0    $58,341
1633600750    SAFETY SW NF GEN DUTY 240V 3P200AMP
Unit values      6.15    185.20    95.32         0.00      1.00 Ea.    280.52
Totals           6.15     $185     $95           $0         $0         $280

U16 ELECTRICAL       7      $185      $95           $0         $0         $280
```



```
=====
Line #      Description
-----
              Manhours   Matl      Labor    Equipment   Sub      Total
=====
```

ESTIMATE TOTAL	791	\$50,185	\$13,048	\$916	\$0	\$64,149
SALES TAX	0.00%	\$0				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$50,185	\$13,048	\$916	\$0	\$64,149
CONTINGENCY	10.00%					\$6,415
BOND	0.00%					\$0
PROFIT	10.00%					\$6,415
JOB TOTAL						\$76,979

```

=====
Estimate:      BLDG  4137          Date:      29-Nov-94
Description:   RENOVATE HVAC SYSTEM COST ESTIMATE
Project:      LIMITED EEAP(HGR) Bid Date:
Location:     FORT BRAGG, N.C.  Job #:      94013.04
Sq. footage:  12000             City indx:Raleigh, NC
=====

```

SUMMARY

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-----
Manhours  Matl    Labor  Equipment  Sub    Total
=====
A09 ELECTRICAL      19      $567      $403          $0      $0      $970
U02 SITEWORK       177         $6      $3,445      $916      $0      $4,367
U03 CONCRETE         3      $160       $31          $0      $0      $191
U15 MECHANICAL     585    $49,267     $9,074        $0      $0    $58,341
U16 ELECTRICAL        7      $185       $95          $0      $0      $280

TOTAL              791    $50,185     $13,048      $916      $0    $64,149

SALES TAX           0.00%         $0
MATL MARKUP         0.00%         $0
LABOR MARKUP        0.00%          $0
EQUIPT MARKUP       0.00%          $0
SUB MARKUP          0.00%          $0

TOTAL BEFORE CONTINGENC $50,185     $13,048      $916      $0    $64,149
CONTINGENCY          10.00%          $6,415
BOND                 0.00%          $0
PROFIT               10.00%          $6,415

JOB TOTAL                                $76,979

```

LIFE CYCLE COST ANALYSIS SUMMARY
ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) STUDY: 4242ECO4
INSTALLATION & LOCATION: FORT BRAGG REGION NOS. 4 LCCID FY95 (92)
PROJECT NO. & TITLE: 94013.04 LES: ECO4 - HVAC RENOVATIONS CENSUS: 3
FISCAL YEAR 95 DISCRETE PORTION NAME: ECO
ANALYSIS DATE: 12-12-94 ECONOMIC LIFE 20 YEARS PREPARED BY: G.B. LOFLIN

1. INVESTMENT

A. CONSTRUCTION COST	\$	14756.	
B. SIOH	\$	738.	
C. DESIGN COST	\$	738.	
D. TOTAL COST (1A+1B+1C)	\$	16232.	
E. SALVAGE VALUE OF EXISTING EQUIPMENT	\$	0.	
F. PUBLIC UTILITY COMPANY REBATE	\$	0.	
G. TOTAL INVESTMENT (1D - 1E - 1F)	\$		16232.

2. ENERGY SAVINGS (+) / COST (-)

DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS OCT 1994

FUEL	UNIT COST \$/ MWH(1)	SAVINGS MWH/YR(2)	ANNUAL \$ SAVINGS(3)	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
A. ELECT	\$ 34.95	-1.	\$ -39.	15.08	\$ -585.
B. DIST	\$ 19.18	101.	\$ 1932.	18.57	\$ 35881.
C. RESID	\$.00	0.	\$ 0.	21.02	\$ 0.
D. NAT G	\$ 13.44	0.	\$ 0.	18.58	\$ 0.
E. COAL	\$.00	0.	\$ 0.	16.83	\$ 0.
F. PPG	\$.00	0.	\$ 0.	17.38	\$ 0.
M. DEMAND SAVINGS			\$ 555.	14.88	\$ 8258.
N. TOTAL		100.	\$ 2448.		\$ 43554.

3. NON ENERGY SAVINGS(+) / COST(-)

A. ANNUAL RECURRING (+/-)		\$	3421.
(1) DISCOUNT FACTOR (TABLE A)	14.88		
(2) DISCOUNTED SAVING/COST (3A X 3A1)		\$	50900.

B. NON RECURRING SAVINGS(+) / COSTS(-)

ITEM	SAVINGS(+) COST(-) (1)	YR OC (2)	DISCNT FACTR (3)	DISCOUNTED SAVINGS(+)/ COST(-) (4)
d. TOTAL	\$ 0.			0.

C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+)/COST(-) (3A2+3Bd4) \$ 50900.

4. FIRST YEAR DOLLAR SAVINGS $2N3+3A+(3Bd1/(YRS\ ECONOMIC\ LIFE))$ \$ 5869.

5. SIMPLE PAYBACK PERIOD (1G/4) 2.77 YEARS

6. TOTAL NET DISCOUNTED SAVINGS (2N5+3C) \$ 94454.

7. SAVINGS TO INVESTMENT RATIO (SIR) = $(6 / 1G) =$ 5.82
(IF < 1 PROJECT DOES NOT QUALIFY)

8. ADJUSTED INTERNAL RATE OF RETURN (AIRR): 12.48 %

```

=====
Estimate:      BLDG 4242          Date:      02-Dec-94
Description:    RENOVATE HVAC SYSTEM COST ESTIMATE
Project:        LIMITED EEAP(HGR) Bid Date:
Location:       FORT BRAGG, N.C.  Job #:      94013.04
Sq. footage:    6000.00          City indx:Raleigh, NC
=====

```

Line #	Description	Manhours	Matl	Labor	Equipment	Sub	Total
0913100280	FEEDER INSTALLATION, INCLUDING CONDUIT AND WIRE, 200 AMPERES					300.00 L.F.	
Unit values		0.31	9.45	6.71	0.00	0.00	16.16
Totals		91.80	\$2,834	\$2,013	\$0	\$0	\$4,847
A09 ELECTRICAL		92	\$2,834	\$2,013	\$0	\$0	\$4,847

```
=====
Line #      Description
-----
              Manhours   Matl      Labor   Equipment   Sub      Total
=====

0207183600   HVAC DEMO,MECH EQPT
Unit values   14.55       0.00    314.87      0.00      0.30 Ton  314.87
Totals        4.36       $0      $94         $0         $0         $94

U02 SITEWORK      5         $0      $94         $0         $0         $94
```

=====						
Line #	Description					

	Manhours	Matl	Labor	Equipment	Sub	Total
=====						
1571805070	ROOF TOP A/C SINGLE ZONE ELECTRIC COOL ONLY 5					
	TON W/ CURB				1.00 Ea.	
Unit values	20.00	4195.80	423.50	0.00	0.00	4619.30
Totals	20.00	\$4,196	\$424	\$0	\$0	\$4,620
1572500520	AC&V DUCTWRK GALV STL 200 TO 500LB					
					500.00 Lb.	
Unit values	0.10	1.56	1.51	0.00	0.00	3.07
Totals	49.00	\$779	\$756	\$0	\$0	\$1,535
1572501560	AC&V FLX DCT COATED FIBERGLASS FABRIC ON					
	METAL HELIX NO INSUL 6" DIA				50.00 L.F.	
Unit values	0.06	1.03	0.85	0.00	0.00	1.88
Totals	2.85	\$51	\$43	\$0	\$0	\$94
1574705040	AC&V AIR RTN DMP CL&WL 45< BLD 8X6" REGISTER					
					5.00 Ea.	
Unit values	0.33	13.99	5.51	0.00	0.00	19.49
Totals	1.67	\$70	\$28	\$0	\$0	\$98
1574807506	AC&V VARI VLM MODULATING MOTORIZED DMP 10X6					
					5.00 Ea.	
Unit values	0.57	108.89	9.47	0.00	0.00	118.36
Totals	2.86	\$544	\$47	\$0	\$0	\$591
1574807700	VARI VLM MODULATING MOTORIZED THERMST ADD					
					3.00 Ea.	
Unit values	1.00	29.47	16.64	0.00	0.00	46.11
Totals	3.00	\$88	\$50	\$0	\$0	\$138
U15 MECHANICAL	80	\$5,728	\$1,348	\$0	\$0	\$7,076

```
=====
Line #      Description
-----
            Manhours   Matl      Labor   Equipment   Sub      Total
=====

1633600750   SAFETY SW NF GEN DUTY 240V 3P200AMP
Unit values      6.15      185.20      95.32      0.00      1.00 Ea.
Totals           6.15      $185        $95        $0        0.00      280.52
                                $0        $0        $0        $0        $280

U16 ELECTRICAL      7      $185        $95        $0        $0        $280
```

```
=====
Line #      Description
-----
              Manhours   Matl      Labor    Equipment    Sub      Total
=====
```

ESTIMATE TOTAL	184	\$8,747	\$3,550	\$0	\$0	\$12,297
SALES TAX	0.00%	\$0				
MATL MARKUP	0.00%	\$0				
LABOR MARKUP	0.00%		\$0			
EQUIPT MARKUP	0.00%			\$0		
SUB MARKUP	0.00%				\$0	
TOTAL BEFORE CONTINGENC		\$8,747	\$3,550	\$0	\$0	\$12,297
CONTINGENCY	10.00%					\$1,230
BOND	0.00%					\$0
PROFIT	10.00%					\$1,230
JOB TOTAL						\$14,756


```

=====
Estimate:      BLDG  4242          Date:      02-Dec-94
Description:    RENOVATE HVAC SYSTEM COST ESTIMATE
Project:       LIMITED EEAP(HGR) Bid Date:
Location:      FORT BRAGG, N.C.  Job #:      94013.04
Sq. footage:   6000.00          City indx:Raleigh, NC
=====

```

SUMMARY

```

-----
Manhours  Matl    Labor  Equipment  Sub    Total
=====
A09 ELECTRICAL      92    $2,834    $2,013        $0    $0    $4,847
U02 SITEWORK        5         $0         $94         $0    $0     $94
U15 MECHANICAL     80    $5,728    $1,348        $0    $0    $7,076
U16 ELECTRICAL      7     $185     $95         $0    $0     $280
TOTAL              184    $8,747    $3,550        $0    $0   $12,297

SALES TAX           0.00%         $0
MATL MARKUP         0.00%         $0
LABOR MARKUP        0.00%         $0
EQUIPT MARKUP       0.00%        $0
SUB MARKUP          0.00%        $0

TOTAL BEFORE CONTINGENC $8,747    $3,550        $0    $0   $12,297
CONTINGENCY         10.00%         $0
BOND                0.00%         $0
PROFIT              10.00%         $0
JOB TOTAL                                     $14,756

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